Centers for Medicare & Medicaid Services
Current Enterprise Architecture
Version 3.0

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Introduction

The Chief Information Officer (CIO) at the Centers for Medicare and Medicaid Services (CMS) has made substantial progress in developing an information technology (IT) vision for CMS and putting into place an information technology architecture (ITA) program to support this vision. However, more work is needed to mature the program's effectiveness—to "take it to the next level"—so that CMS can ensure that it meets the needs of the business users and achieves the full benefits of its IT. Taking the ITA program to the next level of maturity requires integrating all of the architectural components to establish an enterprise architecture. Having a mature enterprise architecture program will aid decision-making about strategic investments in IT resources to better meet the challenges arising from implementing new large programs. To put it another way, the existence of a mature enterprise architecture will enable CMS to establish an effective IT management and governance process.

In maturing its enterprise architecture program, CMS engaged consulting services of the Logistics Management Institute (LMI) to perform an independent review and assessment of all of the existing architectural components, in order to determine whether there were any substantive shortfalls in the various repositories of architecture information. LMI assessed the maturity, depth, and breadth of CMS's current architecture; the ability of the current architecture to support CMS's mission; and the ability of the architecture to support new functions resulting from business drivers. As of this publication, LMI's engagement with CMS is ongoing.

To help ensure consistency of the products maintained in support of the architecture, CMS has developed an enterprise architecture conceptual framework comprising the four architectural domains: business, information, application, and infrastructure. CMS has also condensed the seven-volume set of architecture documentation, previously published as Version 2, into this single document, published as Version 3. Additionally, the mission, vision, objectives, IT guiding principles and design principles was consolidated into one section that focuses on strategic business and IT alignment. Through working with LMI, CMS is also establishing a single repository for all architectural information using the Popkin's System Architect tool.

Using an integrated four-layer framework and capturing all architectural material in one place makes it possible to identify relationships among different pieces of architectural information—objects—and to keep the repository of architectural objects up-to-date. As a result, CMS can easily see how modifying one object in the repository will affect all of the other objects associated with it, making assessment more straightforward. Moreover, by having an integrated enterprise architecture—one that addresses the mission and vision of CMS as well as the information technology in place to support specific business operations—CMS can focus on one functional area while maintaining a sense of the whole enterprise.

This document is a snapshot of what is in the current enterprise architecture repository. Table 1–1 shows the structure of the current enterprise architecture along with the sources of architectural information used in the newly integrated architecture. The appendix lists additional sources.

Table 1–1. Sources of Information for Current Enterprise Architecture

Current enterprise architecture	Sources of architectural information	
	ITA Version 2.0	Other
Chapter 2, Business and IT Alignment	Volumes 1, 2, 3, and 4	—
Chapter 3, Business Architecture	Volume 2	CMS Workforce Planning Study
Chapter 4, Information Architecture	Volume 3	—
Chapter 5, Application Architecture	—	Enterprise Systems Inventory Database
Chapter 6, Infrastructure Architecture	Volume 5	Enterprise Systems Inventory Database
		Standards Profile Database

Note: ITA Version 2.0 treated security as a discrete component. The current enterprise architecture incorporates security in all four layers.

BACKGROUND

In the following subsections, we describe the CMS enterprise architecture framework, the integrated approach to security, and the management and governance process.

CMS Enterprise Architecture Framework

Enterprises—whether government agencies or private organizations—often undertake activities to improve IT within a functional subject area (e.g., personnel or payroll). However, a change in the IT services in one functional area may affect other aspects of the enterprise. One of the major challenges in IT analysis is to determine specifically what those impacts are likely to be. Determining likely impacts requires understanding the interrelationships of an enterprise's functional and technical environment.

To gain that understanding, CMS developed its integrated enterprise architecture:

> An enterprise architecture…defines the business, the information necessary to operate the business, the technologies necessary to support the business operations, and the transitional processes necessary for implementing new technologies in response to the changing needs of business.[1]

An enterprise architecture provides a framework that facilitates the analysis of system efficiencies, platforms, and communications, in alignment with the business needs of an organization. Moreover, it ensures a structured and comprehensive process for evaluating the impact and consequences of changes in technology and business processes. The framework is a tool that can be employed when planning for anticipated changes in hardware and software. When new requirements present themselves, users can look to the framework for guidance in selecting appropriate tools to satisfy those requirements. They can do so with confidence that their selections are compatible with CMS standards and direction, and that assistance in the acquisition, implementation, and support of those tools will continue to be available.

The CMS enterprise architecture framework comprises four separately defined but inter-related architectural layers:

◆ The *business architecture* represents the functions and processes that support the business, the organizations that perform the business, the locations where the business is performed, and the factors that could cause the business to change.

◆ The *information architecture* identifies the major types of information needed to support the business functions. It identifies and defines the information model, data sets, metadata repositories, and their relationships to the business functions and to application systems.

◆ The *application architecture* identifies and describes applications and modules, as well as their relationships to business processes and other applications systems and modules. Major influences include technologies employed and interface requirements.

◆ The *infrastructure architecture* identifies and describes the hardware, software, and communications network technologies required to manage business applications throughout CMS's enterprise.

Figure 1–1 depicts the layers and their interrelationships. The business layer represents the functional processes, and the information, application, and infrastructure layers represent the technical processes.

Figure 1–1. Layers of CMS Enterprise Architecture
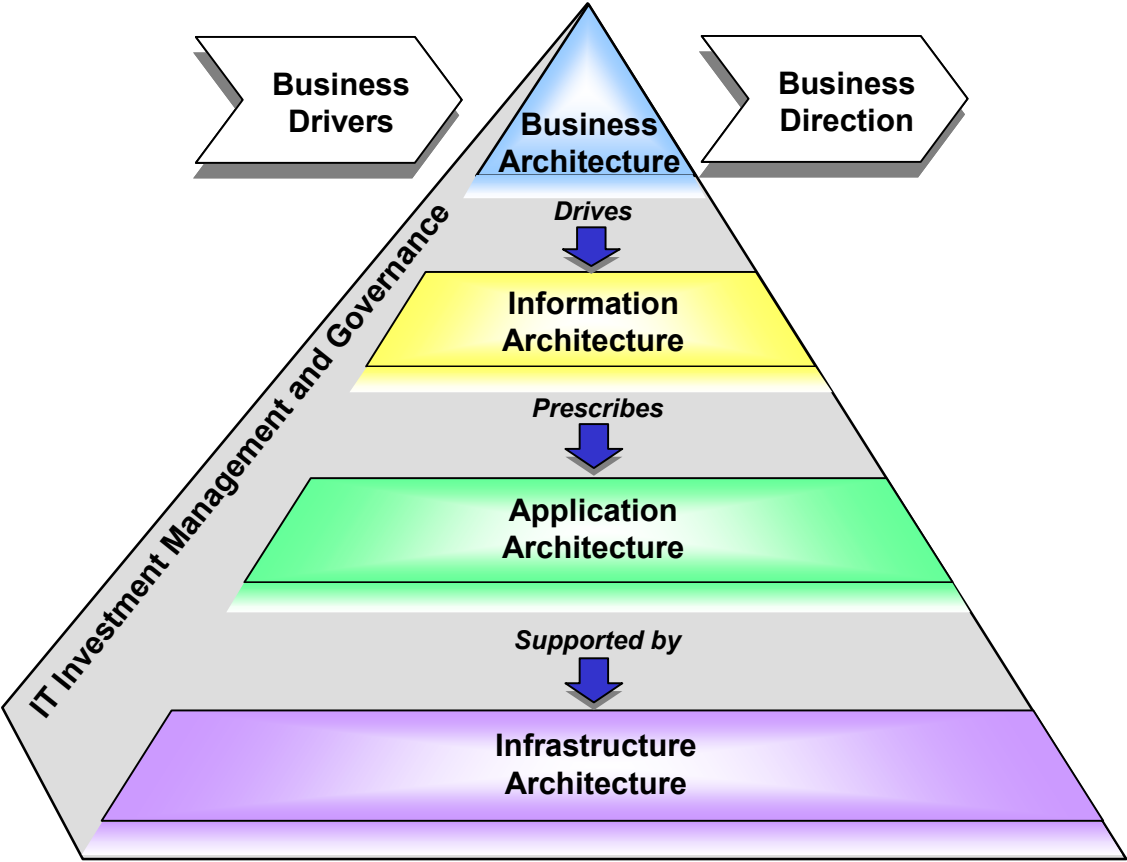
Table 1–2 lists the architectural objects that fall into the domains of the various CMS architectural layers.

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[1] CIO Council, Federal Conceptual Model Subgroup, *Federal Enterprise Architecture Conceptual Framework*, August 1998.

Table 1–2. Objects in Each Architectural Layer

Business architecture	Information architecture	Application architecture	Infrastructure architecture	Objects not in an architectural domain
Any applicable object	Any applicable object	Any applicable object	Any applicable object	Goal
Competency	Any non-business object	Any non-business object	Any non-business object	Mission
Body of knowledge	Data element[a]	Application family[a]	Device type	Objective
Business rule[a]	Data entity[a]	Automated system[a]	Hardware platform[a]	Performance measure
Process[a]	Information class[a]	Logical application system[a]	Network[a]	Principle[a]
Business function[a]	Logical database	Software module[a]	Network connection[a]	Risk[a]
Business need	Physical database[a]		Software facility/ package[a]	Standard[a]
CMS entity	Property			Strategy
Business driver	Subject area[a]			Technical requirement[a]
Customer				Vision
Enabler/inhibitor[a]				
Functional area				
Information need				
Location[a]				
Non-CMS entity				
Policy/procedure				
Product/service[a]				
Program				
Project[a]				
Role				
Satisfaction measure				

[a] Objects that have security attributes.

The conceptual framework has various components that fit into the interrelated architectural layers, and security is integrated throughout the conceptual framework. Figure 1–2 depicts the CMS enterprise architecture conceptual framework. In other words, it shows where objects fit into the architectural layers.

The CMS enterprise architecture conceptual framework was derived from several sources, including the following:

◆ National Institute of Science and Technology (NIST) recommended architectural framework[2]

◆ The Open Group Architecture Framework (TOGAF)[3]

◆ Federal CIO Council's Federal Enterprise Architectural Framework (FEAF)[4]

◆ LMI Enterprise Architecture Practice (LEAP)

◆ Zachman Framework.[5]

The CMS enterprise architecture conceptual framework provides the means for agencies to comply with Office of Management and Budget Circular A-130, *Management of Federal Information Resources*. Updated and released in December 2000, A-130 contains specific guidance on developing an enterprise architecture framework, for which agencies—specifically, agency CIOs—are becoming responsible.[6]

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[2] National Institute of Standards and Technology, *Information Management Directions: The Integration Challenge*, NIST Special Publication 500–167, September 1998.

[3] The original development of TOGAF Version 1 in 1995 was based on the Technical Architecture Framework for Information Management (TAFIM), developed by the US Department of Defense. Starting from this foundation, the members of The Open Group's Architecture Forum have developed successive versions of TOGAF each year.

[4] The federal CIO Council sponsored the development of a common architectural framework for use government-wide to address agency CIOs' requirements for developing robust integrated information technology architectures for the individual agencies. The CIO Council approved Version 1.0 of the framework in August 1998; Version 1.0 referred to the framework as the Federal Information Technology Architecture (FITA). The CIO Council approved Version 1.1 of the framework in September 1999 and referred to it as FEAF.

[5] Framework for Information Systems Architecture, John Zachman, 1987.

[6] Office of Management and Budget, *Circular A-130, Management of Federal Information Resources*, December 2000.

Figure 1–2. CMS Enterprise Architecture Conceptual Framework
(not a flow chart)
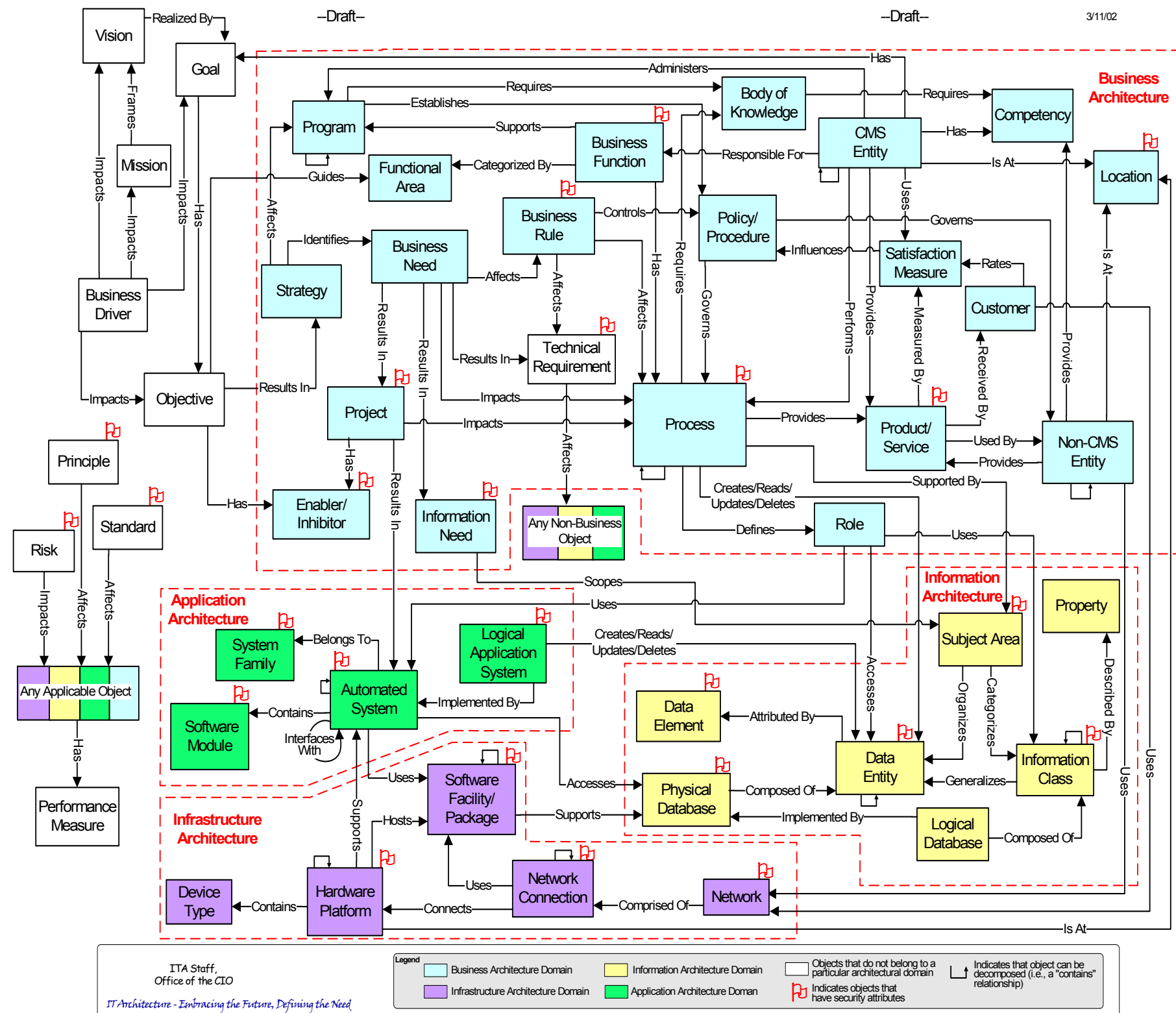
Integrated Security Approach

Security has many facets and many owners. These can range from the contents of personnel policies and hiring practices, to internal controls of functions such as the approval process, to data access and update rights, and then to firewalls and encryption. Capturing these different facets in a separate architecture is essentially duplicating the entire enterprise architecture. Rather than creating unique instance of a security architecture, CMS has chosen to adopt an integrated security architecture. The integrated security architecture reflects the understanding that it is not just the CIO who is responsible for security; the responsibility resides with all the members of the CMS enterprise.

To integrate security within the enterprise architecture, it is necessary to identify the security attributes associated with the components of the architecture. By identifying the attributes of a component and establishing the relationship of the components, an integrated security architecture emerges.

The following are examples of security attributes to be identified, inventoried, and related to enable an enterprise-wide view of the CMS integrated security:

◆ Business architecture—hierarchy of roles and responsibilities, CMS business and administrative functions with legislated or directed security or control practices

◆ Information architecture—ability to create, read, update, and delete data

◆ Application architecture—access control lists, user login

◆ Infrastructure architecture—firewalls, guards, encryption, security protocols.

Management and Governance Process

In this subsection, we describe the organizational roles and responsibilities and the IT decision-making process associated with the management and governance of information technology.

ROLES AND RESPONSIBILITIES

Responsibility for carrying out the mission and for performing the diverse functions of CMS spans several lines of business, and the decision-making authority for IT-related expenditures is similarly dispersed. For example, some CMS programs within agency lines of business receive, apart from CMS's capital investment budget, separate budget appropriations from Congress that can be used to fund programmatic IT initiatives. As a result, it is difficult to integrate all IT investment planning and decision-making throughout the enterprise. For that to happen, business and IT management roles at all levels within CMS must be brought together to foster cooperative and collaborative decision-making.

In making IT investment decisions, CMS must balance a number of competing interests that drive its business priorities. Moreover, technology innovation will continue to present new opportunities and allow different approaches for employing IT to enable operational effectiveness and to meet the requirements of business change. Therefore, CMS requires a framework under which the benefits of IT investment decision-making are optimized for the entire CMS enterprise. Such a framework must

◆ designate who within CMS is responsible for making IT decisions and

◆ establish a process for determining how these decisions are made.

ITA DECISION-MAKING PROCESS

Two primary decision-making processes support IT governance within CMS:

◆ *ITA Policy and Standards Approval Process.* This process formalizes enterprise-wide acceptance and approval of proposed policies and standards for the acquisition and deployment of IT resources. It also ensures that business and technology decisions are made at the appropriate levels of management within CMS, and it promotes consistency in IT decision-making throughout the enterprise.

◆ *IT Investment Review Process.* This process supports CMS in its consideration of IT investments by ensuring that required technology analyses are conducted and full resource costing is identified. It also provides an enforcement mechanism for ensuring that projects requiring the acquisition and deployment of IT resources do so in a manner consistent with the architecture policies and standards guidance, and it ensures compliance with the Clinger-Cohen Act.

REPORT ORGANIZATION

This report documents the current CMS enterprise architecture repository. Chapter 2 presents CMS's business and IT alignment. Chapters 3, 4, 5, and 6 are each devoted to one of the four layers of the CMS enterprise architecture framework. For each, we provide a brief definition and explanation of how the layer is used, then present detailed diagrams and tables representing CMS's current enterprise architecture.

Chapter 2
Business and IT Alignment

The business enterprise direction defines what CMS is about and establishes what it is trying to achieve. The business enterprise direction provides the basis or the foundation for the entire enterprise architecture. It encompasses CMS's mission, vision, business drivers, strategic goals, strategic business objectives, information needs, IT vision, IT objectives, IT guiding principles, and IT design principles. The business enterprise direction is essentially used as a guidance tool and remains relatively stable over time.

The business enterprise direction was developed from Volumes 1 and 3 of the CMS IT Architecture, Version 2.0. November 1999.

CMS, formerly known as the Health Care Financing Administration (HCFA), was created in 1977 to bring together the two largest federal health care programs under one leadership. In the nearly 25 years since, CMS's mission has grown beyond the Medicare and Medicaid programs to include responsibility for additional programs such as federal oversight of clinical laboratories under the Clinical Laboratory Improvement Act, individual and small group health insurance regulation under the Health Insurance Portability and Accountability Act, and the State Children's Health Insurance Program under the Balanced Budget Act of 1997. CMS is the largest purchaser of health care in the United States, serving 72 million Medicare and Medicaid beneficiaries. Six million of the beneficiaries are served by both programs. CMS has about 4,000 employees in locations around the country. These include physicians, nurses, and other health professionals; statisticians; actuaries; specialists in financial management, information systems, public information, laws, and regulations; and experts in many other fields. Through the Medicare and Medicaid programs, more than $430 billion in entitlement funds are expended annually for health care services and products for beneficiaries.

In 1996, CMS embarked on a major reorganization effort, which began with extensive analysis and wide consultation on the roles CMS should undertake over the next 5 to 10 years. Out of this process came a clarified sense of CMS's mission and vision for the future.

MISSION STATEMENT

CMS's mission is to "assure health care security for beneficiaries." For CMS, health care security means

- access to quality health care services that are affordable to beneficiaries,

- protection of the rights and dignity of beneficiaries, and

- provision of clear and useful information to beneficiaries and providers to help them make health care decisions.

VISION

In its stewardship of the Medicare and Medicaid programs, CMS leads the nation's health care system toward improved health for all. The vision addresses the business needs of the whole enterprise.

The vision reflects CMS's commitment to

- strive toward the best possible health outcomes for Medicare and Medicaid beneficiaries, in cooperation with states and other partners;

- purchase health care for our beneficiaries that represents "best value"—high-quality care at the best possible price; and

- use market presence as the nation's largest purchaser of health care to promote continuous improvement in both quality and value throughout the health care system.

BUSINESS DRIVERS

Business drivers influence CMS's decisions about its direction and priorities. They affect CMS's business decisions about which operations will continue, which will change, and which will be discontinued. The business drivers ultimately affect decisions about CMS's directions and priorities. The following is a list of CMS's business drivers:

- Public purchaser. CMS has established a business goal to purchase the best-value health care for beneficiaries.

- Partnerships. CMS accomplished its mission working by, with, and through a complex network of organizations, which include other federal agencies, states, tribes, providers, etc.

- New statutory mandates. Enactment of the Health Insurance Portability and Accountability Act (HIPAA) of 1996 and the Balanced Budget Act (BBA) of 1997 has significantly changed the statutory framework within which CMS operates. Enactment of the Clinger-Cohen Act of 1996 requires the CMS IT organization to better support its mission and objectives and to improve program performance through the appropriate use of information technology.

- Program integrity. The size and scope of CMS's programs necessitate an emphasis on the prevention and detection of waste, fraud, and abuse.

- Changes in health care delivery. The growth of managed care delivery arrangements in the 1990s has been significant. More than 100 million people are now enrolled in some form of managed care. Uninsured and underinsured populations are growing due to the rising cost of employer-based health insurance benefit plans.

- Technological advances. Medical technology is evolving and unfolding more rapidly than ever; it is changing the nature and delivery of health care. Technological advances and supporting procedures are one of the primary reasons that health care costs have risen faster than the consumer price index.

- Demographic changes. Steady improvement in life expectancy is expected to result in major increases in the number of older people relative to those of working age. A substantial proportion of the future aged population will require medical care. Payroll tax revenues will not keep pace with expected Medicare expenditures.

- Focus on beneficiaries. CMS's emphasis on accountability/stewardship and a renewed focus on the "customer" is due to varied initiatives, such as those related to the CMS strategic plan begun in 1994, the Government Performance and Results Act, and other DHHS- and government-wide initiatives.

- CMS management. Since CMS's establishment in 1977, its statutory responsibilities have grown beyond the administration of Medicare and Medicaid to include responsibility for federal oversight of clinical laboratories, Medigap insurance, health insurance regulation of individuals and small groups, and the expansion of health insurance coverage to low-income children.

STRATEGIC GOALS

CMS's strategic goals represent the understanding of CMS's statutory responsibilities and provide a broader sense of purpose and direction as seen through CMS's perspective. The strategic goals are broadly defined statements of what the enterprise would like to accomplish within the planning horizon, which is generally 3–5 years. The following represent CMS's goals:

- Foster excellence in the design and administration of CMS's programs

- Promote beneficiary and public understanding of CMS and its programs

- Promote the fiscal integrity of CMS programs

- Protect and improve beneficiary health and satisfaction

- Provide leadership in the broader public interest to improve health

- Purchase the best-value health care for beneficiaries.

STRATEGIC BUSINESS OBJECTIVES

While CMS's strategic goals may be viewed as high-level statements of what it is going to accomplish, objectives provide high-level statements of how CMS is going to accomplish its goals. Table 2–1 lists CMS's strategic objectives, which together portray the business direction and provide the foundation for IT planning activities.

Table 2–1. Strategic Business Objectives

Category	Objective	Description
Customer services	CS-1	Improve beneficiary satisfaction with programs, services, and care.
	CS-2	Enhance beneficiary program protections.
	CS-3	Increase the usefulness of communications with beneficiaries.
	CS-4	Increase the usefulness of communications with constituents, partners, and stakeholders.
	CS-5	Ensure that programs and services respond to the health care needs of beneficiaries.
Quality of care	Q-1	Improve health outcomes.
	Q-2	Improve access to services for underserved and vulnerable beneficiary populations.
	Q-3	Protect beneficiaries from substandard care.
Program administration	PA-1	Build a high-quality, customer-focused team.
	PA-2	Enhance program safeguards.
	PA-3	Maintain and improve CMS's position as a prudent program administrator and an accountable steward of public funds.
	PA-4	Increase public knowledge of the financing and delivery of health care.
	PA-5	Improve CMS's management of information systems/ technology.

Note: Strategic objective categories are mapped to each functional area in Table 3–1.

INFORMATION NEEDS

Identifying CMS's major information needs (INs) contributes to an understanding of the agency's information environment. These information needs are driven by business demands identified in CMS's strategic plan. Evolving new models of health care delivery and rapid advances in technology are revolutionizing the provision of health care across

the globe. As the nation's largest health care insurer, CMS must be able to adapt to this changing environment. Information is key to CMS's ability to achieve its mission.

The following are CMS's major program INs:

◆ IN-1: Knowledge about beneficiary characteristics, needs, and awareness is essential, as CMS plans to assess beneficiaries' functional status over time; conduct extensive beneficiary education programs; and reach vulnerable populations. This knowledge includes identification and information collection activities regarding special population—e.g., immigrants.

◆ IN-2: Comparative data, benchmark and quality indicators, and outcome-oriented measures are crucial to CMS's ability to ensure that beneficiaries have access to new technologies and medical practices as they emerge and are supported by authoritative scientific evidence.

◆ IN-3: Cost and financial data, such as that related to policies and programs, interventions and outcomes, and health care service delivery, are key to evaluating health care plan financing options and overall health system expenditure trends.

◆ IN-4: Outcome and assessment data are crucial to CMS's ability to evaluate different service delivery models, specific intervention strategies, population and setting trends, and the impact of program changes on various populations.

◆ IN-5: Knowledge of customer expectations and satisfaction is necessary to assess the ongoing effectiveness of CMS's programs and to measure improvements in beneficiary health.

Information needs directly related to public responsiveness include the following:

◆ IN-6: Integrated health information from a variety of sources, supported by common data exchange standards, is necessary to:

➤ provide consumer information on health care plan and provider options, including comparative data on services, cost, and quality of care;

➤ support comparative population and practice studies that require connection of service providers and patient episodes, or require a combination of clinical, survey, and other types of data; and

➤ support analysis across Medicare, Medicaid, and Child Health populations.

◆ IN-7: User-empowering, Internet-based access to CMS's information assets.

Information needs directly related to management of human and technology resources include the following:

◆ IN-8: Workforce skills, training needs, and satisfaction; required competencies; and industry trends and developments in the human resource management and management science fields are key to the development and maintenance of an effective, customer-focused team.

◆ IN-9: Knowledge of IT trends and best practices is necessary to enable effective management of IT investment contracts and ensure appropriate use of technology.

Table 2–2 relates information needs directly to business drivers and strategic objectives.

Table 2–2. Relationship of Information Needs to Business Drivers and Strategic Objectives

Business drivers key external factors	Strategic objectives	Information needs
Public purchaser CMS has established a business goal to purchase the best value health care for beneficiaries.	CS-5: Ensure that programs and services respond to the health care needs of beneficiaries. PA-2: Enhance program safeguards. PA-3: Maintain and improve CMS's position as a prudent program administrator and an accountable steward of public funds.	IN-1: Knowledge about beneficiary characteristics, needs, and awareness IN-3: Cost and financial data IN-5: Knowledge of customer expectations and satisfaction IN-6: Integrated health information
Partnerships CMS accomplishes its mission by working with and through a complex network of organizations, which includes other federal agencies, states, tribes, providers, and others.	CS-4: Increase the usefulness of communications with constituents, partners, and stakeholders. PA-1: Build a high-quality, customer-focused team.	IN-5: Knowledge of customer expectations IN-8: Workforce skills

Business drivers key external factors	Strategic objectives	Information needs
New statutory mandates Enactment of HIPAA and BBA significantly changed the statutory framework within which CMS operates. Enactment of the Clinger-Cohen Act of 1996 requires the CMS IT organization to better support the agency's mission and objectives, and to improve program performance through the appropriate use of information technology.	CS-2: Enhance beneficiary program protections. CS-3: Increase the usefulness of communications with beneficiaries. CS-4: Increase the usefulness of communications with constituents, partners, and stakeholders. Q-1: Improve health outcomes. Q-2: Improve access to services for underserved and vulnerable beneficiary populations. Q-3: Protect beneficiaries from substandard care. PA-2: Enhance program safeguards. PA-5: Improve CMS's management of information systems/technology.	IN-1: Knowledge about beneficiary characteristics, needs, and awareness IN-4: Outcome and assessment data IN-5: Knowledge of customer expectations and satisfaction IN-6: Integrated health information IN-9: Knowledge of IT trends and best practices
Program integrity The size and scope of CMS's programs necessitate an emphasis on prevention and on detection of waste, fraud, and abuse.	CS-2: Enhance beneficiary program protections. Q-3: Protect beneficiaries from substandard care. PA-2: Enhance program safeguards.	IN-4: Outcome and assessment data IN-6: Integrated health information
Changes in health care delivery Growth of managed care delivery arrangements in the 1990s has been significant; more than 100 million people are now enrolled in some form of managed care; uninsured and underinsured populations are growing due to rising costs of employer-based health insurance benefit plans.	Q-1: Improve health outcomes. Q-2: Improve access to services for underserved and vulnerable beneficiary populations. PA-4: Increase public knowledge of the financing and delivery of health care.	IN-1: Knowledge about beneficiary characteristics IN-4: Outcome and assessment IN-6: Integrated health information IN-7: User-empowering, Internet-based access to CMS information
Technological advances Medical technology is evolving and unfolding more rapidly than ever; it is changing the nature and delivery of health care. Technological advances and supporting procedures are one of the primary reasons that health care costs have risen faster than the consumer price index.	CS-5: Ensure that programs and services respond to the health care needs of beneficiaries. Q-1: Improve health outcomes.	IN-1: Knowledge about beneficiary characteristics IN-4: Outcome and assessment data IN-5: Knowledge of customer expectations
Demographic changes Steady improvement in life expectancy is expected to result in major increases in the number of older persons relative to those of working age. A substantial proportion of the future aged population will require medical care. Payroll tax revenues will not keep pace with expected Medicare expenditures.	PA-3: Maintain and improve CMS's position as a prudent program administrator and an accountable steward of public funds.	IN-3: Cost and financial data
Focus on beneficiaries Emphasis on accountability/stewardship and a renewed focus on the "customer" due to varied initiatives, such as those related to CMS Strategic Plan begun in 1994, Government Performance and Results Act, and other DHHS and government-wide initiatives.	CS-1: Improve beneficiary satisfaction with programs, services and care. CS-2: Enhance beneficiary program protections. CS-3: Increase the usefulness of communications with beneficiaries. CS-5: Ensure that programs and services respond to the health care needs of beneficiaries. Q-1: Improve health outcomes. Q-2: Improve access to services for underserved and vulnerable beneficiary populations. Q-3: Protect beneficiaries from substandard care.	IN-1: Knowledge about beneficiary characteristics, needs, and awareness IN-4: Outcome and assessment IN-5: Knowledge of customer expectations and satisfaction IN-6: Integrated health information

Table 2–2. Relationship of Information Needs to Business Drivers and Strategic Objectives (Continued)

Business drivers key external factors	Strategic objectives	Information needs
CMS management Since CMS's establishment in 1977, the Agency's statutory responsibilities have grown beyond administration of Medicare and Medicaid to include responsibility for Federal oversight of clinical laboratories, oversight of Medigap insurance, oversight of health insurance regulation for individuals and small groups, and to expand health insurance coverage to low-income children.	CS-4: Increase the usefulness of communications with constituents, partners, and stakeholders. PA-1: Build a high-quality, customer-focused team. PA-2: Enhance program safeguards. PA-3: Maintain and improve CMS's position as a prudent program administrator and an accountable steward of public funds. PA-4: Increase public knowledge of the financing and delivery of health care. PA-5: Improve CMS's management of information systems/technology.	IN-3: Cost and financial data IN-5: Knowledge of customer expectations and satisfaction IN-6: Integrated health information IN-7: User-empowering, Internet-based access to CMS information IN-8: Workforce skills, training needs, and satisfaction IN-9: Knowledge of IT trends and best practices

IT VISION

At CMS, as in agencies and companies everywhere, business executives face major challenges in achieving their business objectives. Clearly, information plays a major role in providing the answers and insights they need to succeed. Senior executives at CMS, like their counterparts in other organizations, have consistently voiced their needs with respect to information and IT in the following areas:

◆ Access to data that is in a useful format and is available where and when needed, and the ability to share that data across CMS;

◆ Accurate and consistent (i.e., "reliable") information;

◆ Ability to adapt quickly to changing business needs; and

◆ Achievement of all the above at a reasonable, affordable cost.

CMS's IT Vision was developed in response to these needs. It is a contextual framework for future IT investment at CMS. It describes an environment in which existing and new systems can work more effectively by sharing information, and in which CMS can be more responsive to the demands of changing business needs and the promises of emerging technology. CMS's IT Vision represents a shift from a process-centric paradigm to a focus on information as the foundation of the technology infrastructure. CMS's Information Technology Vision[1] is of a high-level, logical architecture containing the following key characteristics:

1. A central core of "well-managed" databases,

2. A structured "middleware" interface that facilitates access to data in the core databases,

3. An assembly of modular application systems that manage infrastructure inputs and outputs, provide support for data operations (query, statistical analysis, data mining), and facilitate program operations, and

4. Well-defined, integrated security services that control access to databases and applications using strong, two-factor authentication.

IT OBJECTIVES

For CMS to achieve its business objectives, IT initiatives must support the business processes of the organization. The investment in IT requires the exercise of a capital investment process whereby these IT initiatives are evaluated based on criteria relating to the business benefit derived from the investment. CMS has identified eight key objectives for its IT direction and architecture. Table 2–3 summarizes them.

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[1] The complete text of the IT Vision can be found in the document titled, CMS Information Technology Vision, dated 7/30/98.

Table 2–3. IT Objectives

Objective	Description	Rationale	Implications
1	Meaningful information is readily accessible to CMS's beneficiaries, partners, and stakeholders.	Achieving this objective is key to CMS's ability to provide ▪ beneficiaries, partners, and stakeholders with prompt access to meaningful information for decision-making purposes, and ▪ accessible information in order to realize other IT objectives (such as effectiveness and program integrity).	To realize this objective, CMS will ▪ increase the breadth and quality of information delivery mechanisms; ▪ use a variety of information delivery formats in order to serve the diverse beneficiary population; ▪ increase the use of Internet technology; ▪ simplify user access at the user interface; ▪ consolidate and catalog information into distinct business subject areas; ▪ provide adequate resources for additional analysis of information and accessibility needs; ▪ include internal and external staff and agents among the definition of stakeholders; ▪ ensure appropriate security access to sensitive and personal information; ▪ consolidate data into a more comprehensive knowledge pool; and ▪ standardize the data and the information about the data across the enterprise.
2	CMS information assets that support business processes are secure.	Achieving this objective is key to CMS's ability to provide ▪ adequate availability and protection of sensitive information against loss or corruption, ▪ adequate availability and protection of corporate assets against damage or unauthorized use, and ▪ adequate availability and protection of information covered by the Privacy Act.	To realize this objective, CMS will ▪ strengthen security safeguards required by increased use of the Internet; ▪ allocate additional resources for security; ▪ maintain current knowledge of hardware, software, and network security capabilities for potential applicability to our needs; ▪ explore avenues for influencing how the security industry evolves to meet our needs; ▪ classify appropriate levels of application program and data sensitivity and security access; and ▪ identify and define the roles and responsibilities of the data stewards.
3	IT resources are carefully planned and deployed to maintain continuity of service.	Achieving this objective is key to CMS's ability to provide ▪ IT services and resources that meet and exceed customer expectations, and ▪ risk mitigation through prudent program and project management.	To realize this objective, CMS will ▪ clearly identify the requirements for operational continuity in each of our business functions; ▪ carefully deploy and implement IT solutions (e.g., capacity management, resource allocation, backup/recovery, and disaster planning) that are consistent with our business requirements; ▪ incorporate requirements into procurements for outsourcing operations services; ▪ incorporate appropriate review criteria into the IT investment process; ▪ strengthen methodologies for the execution of system development life-cycle phases (e.g., testing and validation) during technology deployment; and ▪ require collaborative planning between technology providers and users for long-term and near-term IT investments.
4	IT support to CMS's business processes is efficient (efficiency is an internal measure of the cost of doing business).	Achieving this objective is key to CMS's ability to provide ▪ optimum allocation and use of resources, ▪ greater return on investment, and ▪ enhanced delivery of vital information.	To realize this objective, CMS will ▪ adhere to standards and develop procedures for reuse of IT resources that increase interoperability and promote resource sharing; and ▪ weigh the tradeoff between greater efficiency and the inherent value provided to the business.

Table 2–3. IT Objectives (Continued)

Objective	Description	Rationale	Implications
5	IT resources are maneuverable (flexible and adaptable).	Achieving this objective is key to CMS's ability to provide ▪ solutions that enable quick adaptation to changing business needs, and ▪ flexibility for reallocating resources to critical processes.	To realize this objective, CMS will ▪ develop and implement a coherent long-range plan and vision in order to improve operational efficiencies; ▪ build systems in modules and use standard interfaces to make applications more adaptable to changing requirements; ▪ consolidate and redesign information to allow users to navigate better across functional areas (e.g., Medicare and Medicaid); ▪ identify specific policies and standards to assimilate new information; ▪ implement mature project management processes for repeatability, improved quality, and reduction of life-cycle costs; ▪ evolve to a common hardware and software infrastructure that allows standard access to all system capabilities; ▪ adopt a standard method of selecting tools to support information management needs; ▪ develop a common approach for IT resource accounting across the enterprise; and ▪ implement a cohesive data administration program that ensures standardization of information about our data.
6	IT is effectively applied to CMS's business needs (effectiveness is a measure of the value of IT to the business).	Achieving this objective is key to CMS's ability to provide ▪ timely, accurate, and complete information that supports effective decision-making and facilitates assessment of program and provider performance; ▪ resources for the timely deployment of program initiatives; and ▪ tools to enhance user productivity, thereby allowing better use of intellectual capital.	To realize this objective, CMS will ▪ closely coordinate and integrate IT and program team efforts; ▪ implement a requirements determination process with the active participation of the business components; ▪ clearly define and implement business performance measures to evaluate IT support; ▪ continually reevaluate solutions to business requirements in order to take advantage of available technologies; and ▪ redistribute resources, services, and functions to better serve our customers.
7	IT is effectively applied to support program integrity.	Achieving this objective is key to CMS's ability to provide ▪ proper and accurate payments of complex beneficiary claims transactions; ▪ appropriate payment to the correct provider at the proper time, rather than chasing after improper payments; and ▪ proactive identification of potentially improper or inaccurate claims.	In order to realize this objective, CMS will ▪ invest in data mining and data warehousing capabilities that support data analysis requirements necessary to monitor program integrity; ▪ organize information and data so that it is accessible during prepayment fraud detection activities and is available to support analytical processes; and ▪ realign processes and applications to identify potentially improper or inaccurate payments.
8	IT core competencies of CMS staff are targeted and strengthened.	Achieving this objective is key to CMS's ability to provide ▪ expertise in current technologies in order to provide the most effective business solutions; and ▪ optimal use of federal staff and contractors.	To realize this objective, CMS will ▪ identify the set of core competencies needed to support CMS's current and strategic business objectives (e.g., in the future, new core competencies in research, development, or technology may be required); ▪ concentrate IT training in the core competencies; ▪ allocate adequate federal resources to support the core competency areas; ▪ consider outsourcing IT needs outside the core competency areas; and ▪ establish metrics for measurement and improvement.

IT GUIDING PRINCIPLES

CMS, in developing and investing in IT, will face many choices driven by legislation, budgetary constraints, and changes in technology. CMS has identified 15 IT guiding principles to aid decision-makers in arriving at these key decisions. These IT guiding principles represent the values that will shape CMS's definition and implementation of its enterprise architecture. Table 2–4 lists the IT guiding principles.

Table 2–4. IT Guiding Principles

Principle	Description	Rationale	Implications
1—Support a single enterprise-wide information technology architecture	Enterprise-wide, within the context of CMS's Information Technology Architecture, includes all IT capital assets (hardware, software, licenses, interfaces, etc.) and services existing within the boundaries of CMS's enterprise.	Adherence to this principle will enable CMS to • play a strategic and vital role in the health care industry; • have an agency-wide, business-aligned, and integrated ITA to help fulfill our mission; • make strategic investment decisions; • increase interoperability, standardization, and operational effectiveness; • reduce long-term IT costs; • link information technology to the business functions as required by the Clinger-Cohen Act of 1996; and • provide easier access to enterprise data with improved quality.	Adhering to this principle requires that CMS • ensure that senior management across the agency is fully committed to this approach; • implement processes to instill the necessary cultural changes; • establish an enterprise-wide governance process to institutionalize policy and standards activities; • standardize interfaces based upon external constraints; • design for flexibility to accommodate changing business requirements; • include business partners more in decision-making processes; • set appropriate interface standards but not dictate the internal IT infrastructure of our business partners; • increase the sharing of hardware and software infrastructure resources; and • budget for the increased short-term start-up cost.
2—Unify planning, management, and governance of the ITA	Establishing a common vision among the IT and business components across the enterprise necessitates unifying the planning, management, and governance of the ITA.	Adherence to this principle will enable CMS to • share responsibility for the deployment, operation, and management of technology with all components and stakeholders; • ensure operational effectiveness by investing in IT in a manner consistent with the requirements of the Clinger-Cohen Act, as well as Department of Health and Human Services and OMB guidance (managing IT assets and expenditures at the enterprise level); • ensure business unit participation in evaluating and making IT investment decisions using consistent criteria; • share data, training, and tools across the enterprise, thereby limiting potential duplication of effort; • maximize the use of IT resources across the enterprise; and • support the principle of having a single enterprise-wide ITA.	Adhering to this principle requires that CMS • engage senior business and IT management, as well as stakeholders, across the enterprise in key decisions that affect development and maintenance of the ITA; • refocus our centralized IT functions to emphasize establishing policy, standards, and guidance; • provide strategic systems services that enable the business units to efficiently develop applications in a distributed IT environment; • develop and promulgate enterprise-wide IT policies and standards; • routinely review policies and standards for appropriateness; • institutionalize an enterprise-wide governance process to maintain the ITA and administer policy and standard compliance-review activities; • impose reasonable constraints on system designs in order to evolve to an enterprise-wide ITA; and • plan for the increased decision time associated with the establishment of unified planning, management, and governance.
3—Use guidelines consistent with the federal ITA framework	CMS's ITA will be developed and maintained consistently with the guidelines established by the Federal CIO Council Information Architecture Conceptual Model and the Department of Health and Human Services ITA.	Adherence to this principle will enable CMS to • ensure interoperability between the departmental/agency architectures as required by the Federal CIO Council; • leverage opportunities to share resources with DHHS OPDIVS at reduced costs; • increase information and data sharing; and • promote best practices within DHHS.	Adhering to this principle requires that CMS • continue to provide proactive representation in the DHHS Information Technology Architecture Group; • include DHHS ITA compliance verification in our IT review and approval processes; • phase in or phase out hardware and software standards and technologies in order to achieve compliance with the DHHS ITA; and • budget for up-front costs to achieve compliance.

Table 2–4. IT Guiding Principles (Continued)

Principle	Description	Rationale	Implications
4—Maintain a strategic ITA outlook	Maintaining a strategic ITA outlook is necessary in order to support the strategic business plans of CMS. The strategic plan defines the goals for our business, a set of objectives describing the direction in which we are headed, and the broad strategies we will use in attaining these goals. Establishing long-term IT goals and objectives as part of our strategic ITA outlook is necessary to ensure proper business and IT alignment.	Adherence to this principle will enable CMS to ▪ achieve long-term IT goals and objectives incrementally, while allowing for their evolution over time.	Adhering to this principle requires that CMS ▪ develop strategic awareness of the business direction for our staff and relevant IT core competencies; ▪ establish attainable long-term IT goals, yet allow for flexibility to adjust to changing business goals; ▪ make investment decisions based upon the strategic ITA goals; ▪ analyze short-term IT investment decisions for their impact on achieving long-term ITA compliance; ▪ make short-term IT investment decisions that do not compromise or foreclose on long-term ITA objectives; and ▪ address possible conflicts arising from the short-term focus of the federal budgeting process.
5—Develop and implement IT projects using enterprise-wide methodologies	CMS IT projects must be developed, implemented, and operated using standardized, enterprise-wide policies, methods, tools, techniques, etc.	Adherence to this principle will enable CMS to ▪ maximize benefits from the sharing of IT resources (people, hardware, design techniques, tools, languages, documentation, etc.); ▪ provide a comprehensive picture of resource utilization throughout the IT project development life cycle; ▪ implement repeatable software development processes; ▪ promote redeployment of staff with minimal retraining; and ▪ minimize the implementation and maintenance costs of developing IT projects.	Adhering to this principle requires that CMS ▪ train staff and adjust resources to make them consistent with adopted methodologies; ▪ change our organizational culture to embrace adopted methodologies; ▪ employ modern systems development methods (e.g., rapid applications development and/or object-oriented design), tools, and techniques in addition to traditional structured practices; ▪ document and promulgate adopted methodologies; ▪ conduct methodology compliance reviews and use sanctions for non-compliance with established methodologies; and ▪ plan and budget for increased up-front development costs and time.
6—Adopt open systems standards	Open systems standards provide the best means of developing applications such that both the design and system implementation are independent of a specific vendor's hardware or software platforms. Products and technologies that are considered compliant with open systems standards use interface specifications that are readily available to all suppliers, service providers, and users, and are revised only with timely notice and public process. Open systems standards allow for continued access to technological innovation supported by many customers and a broad IT industry base. In our approach, however, it is axiomatic that interoperability is more important than openness.	Adherence to this principle will enable CMS to ▪ promote interoperability; ▪ take advantage of lower costs resulting from vendor competition to differentiate their products within the standards framework; ▪ easily adapt technology solutions to satisfy changing business requirements while lowering the total cost of IT ownership; ▪ provide IT solutions that are less susceptible to obsolescence; and ▪ employ standards that ultimately expand our choices of technology solutions, thereby lessening our dependence on single vendor solutions.	Adhering to this principle requires that CMS ▪ focus on standards selection as the basis for product selections; ▪ set up processes for evaluating products for compliance with standards; ▪ carefully track the development and evolution of federal and commercial IT industry standards and their vendor product implementations; ▪ formulate a workable, prioritized migration strategy for adopting and deploying IT using federal and industry standards; ▪ identify criteria for selecting products where no standards have been established; ▪ avoid implementing proprietary IT solutions unless they are key to providing critical business functionality and no acceptable standard and/or product alternatives exist; ▪ incorporate standards requirements into acquisition processes; and ▪ accept suboptimization of product selections in favor of open systems standards.

Table 2–4. IT Guiding Principles (Continued)

Principle	Description	Rationale	Implications
7—Enable the automated, active delivery of information across the enterprise	The automated, active delivery of important information to a user's desktop is more efficient than requiring users to search for the information they need. Users could identify the particular information they need, and, as soon as it became available, the information could be automatically disseminated to those who need it. Software distribution and installation across the enterprise could also be automated.	Adherence to this principle will enable CMS to • enhance our communication and information dissemination capabilities; • tailor information to the specific needs of individuals or groups of users, thereby optimizing the sharing of knowledge; • provide information to users as soon as it becomes available, rather than requiring them to take actions to request the information; and • reliably provide current information in a timely manner, thereby enhancing our program management decision-support capability.	Adhering to this principle requires that CMS • identify user information-access requirements that are best supported using an automated model; • define the roles and responsibilities of data stewards in information dissemination; • implement adequate security mechanisms to ensure that users only receive data and information to which they have authorized access; • develop policies and standards for the automated dissemination of information; and • invest in appropriate IT infrastructure enhancements that are necessary to implement the required technology.
8—Manage information and data as enterprise-wide assets	CMS program operations produce vast amounts of data that must be managed. This massive data collection effort provides the raw material for creating valuable information to support a variety of management, analytical, and research needs throughout the enterprise. Managing information and data as enterprise-wide assets places greater significance on cooperative strategies for satisfying the common information needs of multiple business units across the enterprise, rather than exclusively satisfying parochial component requirements.	Adherence to this principle will enable CMS to • foster the sharing, timeliness, and integrity of information and data; • increase the security and protection of sensitive information and data; • optimize resource utilization while eliminating redundant data management costs; and • increase the quality and consistency of data and information used to support our programs.	Adhering to this principle requires that CMS • clarify the roles and expectations for stewards of enterprise information and data; • clarify management policies and procedures for identifying and classifying enterprise information and data, as well as standardizing access and security; • encourage the cultural changes necessary for evolving to an enterprise-wide information and data management environment; • integrate our infrastructure to permit authorized access to information and data by users enterprise-wide; • establish an enterprise information resource catalog of formal data assets; • employ aggressive safeguards to protect information and data security and privacy; • enhance our infrastructure to support advanced technologies for metadata management, data replication, and secure computing over the Internet; and • plan and budget for potentially increased costs for establishing an enterprise-wide data management infrastructure.

Table 2–4. IT Guiding Principles (Continued)

Principle	Description	Rationale	Implications
9—Design and develop application software components for reusability and platform independence	This principle emphasizes two main characteristics of open systems standards: designing application software as components of an overall system, and designing components for reusability and platform independence. Together, these concepts constitute the minimum requirements for designing and deploying adaptable IT solutions that are capable of evolving with business needs.	Adherence to this principle will enable CMS to ▪ leverage available processing platform resources; ▪ increase application development productivity and responsiveness to business needs; ▪ reduce complexity and enhance functional and technical systems integration by using modular design components; ▪ promote standardized application system design; ▪ expand reusability beyond sharing code to sharing business processes, system designs, tools, documentation, etc.; ▪ reduce costs; and ▪ promote consistency and stability of deployed systems.	Adhering to this principle requires that CMS ▪ plan for migrating application development methods to employ tools and techniques that facilitate sharing, reuse, and platform independence; ▪ establish policies, standards, and procedures for promoting the sharing and reuse of source code, application designs, documentation, etc.; ▪ identify the reusable portions of application logic as distinct from logic specific to particular business processes; ▪ establish and maintain a library of reusable, sharable components; ▪ establish interface standards for sharing reusable components; ▪ develop an architecture model that specifies a layered, modular, platform–independent application design structure; ▪ evolve to an object-oriented application development approach; ▪ design modular application components that are loosely coupled and are capable of being partitioned; ▪ design common system functions and services that are independent of specific application processing requirements and platforms; and ▪ establish and enforce logical partitions between applications, data management, and systems services within application designs.
10—Use custom-developed software instead of commercial/government off-the-shelf products only when warranted and justified	Preference will be given to acquiring COTS or GOTS software products in lieu of developing custom application solutions to business requirements. COTS and GOTS products can range in size and functionality from component functions that "plug" into the existing systems infrastructure, to entire application systems, to enterprise resource systems (e.g., products like SAP, Peoplesoft, and BAAN). Industry trends toward increased software development costs are likely to continue instead of abate, and the appropriate use of COTS and GOTS products is one way to acquire needed IT capabilities in a cost-effective manner. Where using existing components is both possible and feasible, it is no longer acceptable for federal agencies to specify, build, and maintain comparable custom solutions.	Adherence to this principle will enable CMS to ▪ enhance our business and mission effectiveness by exploiting technology solutions that are widely available to customers, partners, and stakeholders; ▪ leverage previous and future investments of public and private sector resources that are committed to sustaining working IT solutions to common business needs; ▪ ease our software maintenance burden, and reduce software development risk; and ▪ benefit from the continually expanding variety of COTS and GOTS technology solutions becoming available to all users.	Adhering to this principle requires that CMS ▪ define software development methods and practices for IT staff to incorporate COTS and GOTS considerations into systems life-cycle processes; ▪ retrain and retool IT staff to use new COTS- and GOTS-related skills as necessary; ▪ define systems development life-cycle processes and procurement standards to be consistent with this principle; ▪ define IT investment decision criteria to weight more favorably the funding for IT projects that employ COTS or GOTS solutions; ▪ acquire only those COTS and GOTS products that incorporate open systems standards-compliant interfaces; ▪ avoid the increased risk and cost associated with using purchased products that require changing the source code in order to be implemented; ▪ acquire COTS and GOTS products only from stable, reliable vendor sources; ▪ participate in user groups to influence product enhancements and priorities; ▪ establish a comprehensive product-evaluation process to ensure that candidate solutions adequately satisfy business requirements; and ▪ give up a measure of control and accept the risk of product changes by the vendor.

Table 2–4. IT Guiding Principles (Continued)

Principle	Description	Rationale	Implications
11—Leverage enterprise-wide licensing of vendor products	Procuring IT products and services from vendors by negotiating enterprise-wide licensing is a cost-effective strategy that leverages the purchasing power of organizations, resulting in a win-win for both parties. Customers benefit from enterprise-wide licensing by paying a lower per-unit cost for products and services and spending less time on procurement actions as compared with piece-meal acquisitions. Vendors prefer enterprise license purchases by their customers because such purchases often result in higher revenue per sale and a more substantial commitment to the vendor's product by the customer. Recent reforms in federal procurement guidelines permit more flexibility to negotiate IT acquisitions to the advantage of the government, with the public being the ultimate beneficiary. Without an enterprise-wide approach, groups within mid- to large-size organizations often purchase IT products piecemeal, in isolation, unaware that other parts of the organization either already use or require the same product. Where feasible, CMS will acquire new IT through enterprise-wide license negotiations, and will consolidate multiple group and individual licenses into enterprise-wide licenses.	Adherence to this principle will enable CMS to - benefit from cost-sharing across organizational components; - lower overall IT costs by leveraging our buying power; - increase our negotiating leverage with vendors; - benefit from economies of scale; - improve our understanding, oversight, and management of IT product and service licenses; - simplify and reduce the administrative burden; - simplify and enhance our vendor relationships and interactions; and - satisfy our IT product and service requirements as a whole.	Adhering to this principle requires that CMS - establish guidelines and metrics for assessing the benefits of enterprise license opportunities; - identify and adopt best practices for enterprise IT acquisitions; and - focus responsibilities and improve procedures for coordinating technology acquisitions.
12—Promote the use of web-based technology	The Internet and its related web-based technologies are the most significant advancements in information systems in the last 5 years. The Internet, intranets, and extranets offer new channels for enhanced communication directly between customers and suppliers. As web-based technologies continue their rapid evolution, they set new standards and establish new paradigms for using computers and networks to solve business problems. Where feasible, we will incorporate the use of web-based technologies (Internet, intranets, and extranets) in designing and deploying IT solutions to support CMS's program needs.	Adherence to this principle will enable CMS to - enhance information dissemination to customers, stakeholders, and partners; - open new channels for interacting with customers, stakeholders, and partners (e.g., beneficiaries, providers, insurers, and other public and private sector organizations); - exploit an existing, widely available, and continually expanding network infrastructure and technology base; and - design applications for computing-platform independence using web-based technology.	Adhering to this principle requires that CMS - acquire adequate resources and skill sets for developing and deploying Web-based IT solutions; - implement processes for developing and promoting appropriate web-based applications and information content; - implement a robust security infrastructure for applications and data access; and - keep abreast of standards influencing the use and future direction of Web-based technology.

Table 2–4. IT Guiding Principles (Continued)

Principle	Description	Rationale	Implications
13—Design and deploy application systems using a client/server model	In a client/server model, application processes are divided between two or more logically partitioned environments, typically a client system (e.g., a program or intelligent workstation) and a server system. Both components engage in co-operatively processing the application functions. Client and server hardware and software components tend to be specialized by design to perform their intended functions. Client/server computing is typically performed with distributed computing platforms over geographically dispersed locations connected by a network. This combination of computing platforms and communications networks is the key enabling element of modern information systems.	Adherence to this principle will enable CMS to ■ design modular, adaptable systems that leverage the inherent flexibility of client/server computing; ■ increase processing efficiency by distributing processing over multiple platforms; ■ benefit from reduced costs in acquiring IT systems due to advantageous-price/performance computer platforms and robust telecommunications technology; ■ exploit the evolution of standards toward open systems; ■ increase systems availability and reliability through distributed processing capabilities that reduce the single point of failure associated with mainframe-centric computing; and ■ improve response time and access to information system resources.	Adhering to this principle requires that CMS ■ acquire and adopt the range of technical skills necessary to effectively develop and deploy IT systems in a client/server architecture; ■ identify and adopt industry best practices for client/server and distributed computing architectures; ■ deploy reliable, robust systems and network management capabilities to maintain a distributed computing environment; and ■ plan for the initial increase in cost associated with acquiring the technologies and skills needed to establish a client/server computing environment.
14—Ensure enterprise-wide integration of IT security	Security is the responsibility of every CMS employee, agent, and business partner. Federal regulatory mandates and directives require CMS to implement appropriate administrative, technical, and physical safeguards to ensure the security and confidentiality of sensitive data and information against unauthorized access and use. CMS has a responsibility to protect the sensitive data and information it collects against anticipated threats or hazards that could result in substantial harm to any individual on whom the information is maintained. Without an integrated approach to security implementation, we cannot ensure that our policies, procedures, and technologies adequately protect the enterprise against known security threats. However, as a practical matter, the cost of implementing adequate security safeguards should not exceed the liability risk or create unnecessary barriers to information access by authorized users.	Adherence to this principle will enable CMS to ■ fulfill our mandatory responsibility to safeguard sensitive personal information; ■ develop a comprehensive approach to security design and implementation that is adequate for the scope of our business enterprise, which is a broadly distributed, networked environment; ■ provide access to the needed information and data to authorized persons only, regardless of where they are located within the enterprise; ■ improve auditing and accountability of access to sensitive data and information; ■ uniformly implement security standards enterprise wide; and ■ exploit available and emerging technologies that strengthen the implementation of security using an enterprise-wide approach.	Adhering to this principle requires that CMS ■ develop security implementation strategies from an enterprise-wide perspective; ■ define consistent roles, responsibilities, and expectations for system managers, application developers, and security administrators enterprise wide; ■ ensure that central IT organizations take the lead in formulating enterprise-wide security policy, providing guidance, and performing compliance audit activities; ■ develop effective programs to test the adequacy of security implementation measures; ■ continually monitor the enterprise for vulnerabilities and threats/risks as the IT environment evolves over time; ■ identify industry best practices for integrating systems security technology, methods, and procedures consistently throughout the enterprise; and ■ plan for the increased cost of implementing an enterprise-wide security strategy.

Table 2–4. IT Guiding Principles (Continued)

Principle	Description	Rationale	Implications
15—Deliver centralized IT support services through-out the enterprise	Centralized IT support services comprise systems and network management capabilities necessary to maintain a distributed computing environment. To maintain business continuity, these services must be monitored and coordinated from a single point. Centralized IT support services provide people, procedures, and tools to maintain the integrity and efficiency of computing resources throughout the enterprise to ensure proper planning, systems deployment, and problem resolution. The scope includes network management, resource management, and systems and security administration. This increased scope reflects the management of IT resources across technology domains and/or vertical business functions to guarantee that the availability and capabilities of the IT delivery systems can fulfill user expectations.	Adherence to this principle will enable CMS to ▪ reduce the total cost of ownership (TCO) and management of IT resources; and ▪ improve the quality, efficiency, and effectiveness of IT service through centrally coordinated, comprehensive management of our distributed computing environment.	Adhering to this principle requires that CMS ▪ invest in solutions that improve centralized IT management and operational efficiency rather than increase staff personnel costs; ▪ retrain and redeploy staff as appropriate to implement a centralized IT management environment; ▪ specify application and infrastructure architectures that enable the design and implementation of standard systems management technology interfaces; ▪ implement enterprise-wide service-level agreements to ensure that IT services and performance adequately support the needs of business operations; and ▪ establish appropriate metrics for monitoring and measuring the efficiency and performance of centralized IT services.

IT DESIGN PRINCIPLES

CMS's IT vision, IT objectives, and IT guiding principles offer broad guidance regarding the target enterprise architecture environment. The IT objectives and IT guiding principles describe, in broad terms, *where we are going* and *how we will get there*, respectively. More specific guidance is needed to further assist decision-makers involved in data and information development activities. The design principles described in this section provide more specific direction relevant to CMS's information architecture.

Two primary groups within CMS are intended to use the guidance presented in this section:

◆ Group 1 includes IT investment project owners, project leaders, system designers, application programmers, and decision-makers engaged in activities to develop data stores.

◆ Group 2 includes IT investment portfolio managers and decision-makers concerned with reviewing facts pertinent to IT investment proposals and deciding which should receive funding approval.

Furthering CMS's evolution to the target information environment requires Group 1 to adhere to certain principles (standards) in development activity involving new and legacy data stores. These standards are considered compulsory and are discussed as design principles in this section. For acceptance criteria, Group 2 may use the design principles, when reviewing IT investments for funding approval, to ensure that IT investments

comply with the target architecture as required by the Office of Management and Budget. These principles also provide standards by which Group 2 may evaluate compliance with the ITA during IT project compliance review processes.

In addition to compulsory standards, other recommended best practices should also be observed by Group 1 to the extent possible. Doing so will advance CMS further toward the target environment. Group 2 may use the recommended best practices when making discretionary funding decisions between competing IT projects that meet compulsory standards. When funds are limited, Group 2 may give preference to IT projects that advance CMS furthest toward the target IT environment.

The design principles described here are a starting point and are not all-inclusive. As CMS gains experience through using this guidance, the list of principles may be modified. No priority is implied by the order in which the principles are listed. A brief explanation is provided, along with pertinent implications, for each design principle. Implications cited indicate considerations that may need to be explicitly addressed within project plans.

The design principles are as follows:

◆ *Use basic mission/business activities to guide the building of data and information topic structures.*

CMS's Information Model Framework is based on subject areas aligned with mission/business activities, as defined in the business architecture. Data structure de-

signs need to map to, and be reconciled with, enterprise models defined in this framework.

The Information Model Framework was defined with two major objectives in mind: (1) the description of information assets in a business context, and (2) the development of sharable data definitions and stores.

Implications:

➤ Emphasis on this design principle must be reinforced through appropriate coverage in the systems development life cycle (SDLC) methodology.

➤ Data modeling represents a specialized role and competency required of CMS and CMS's systems development contractors.

➤ Interfaces between modeling tools and repositories are immature regarding metadata format and content.

➤ Enterprise models of the Information Model Framework will undergo gradual development.

➤ Standards for mapping application-level models to enterprise models must be established.

◆ *Establish data and metadata stores as a decision support and operational tool.*

Documentation of information assets is an integral and mandatory component of any IT project involving data structure development. Documentation and storage of metadata needs to be coordinated with CMS's Data Administration staff.

Two major types of metadata are captured and stored:

➤ Business metadata, which is largely unstructured and answers the following kinds of questions about our data for business analysts and customers:

   ▪ What does it mean?

   ▪ Where can I find it?

   ▪ How was it calculated?

   ▪ What were the sources?

   ▪ What business rules were applied?

   ▪ What training is available?

   ▪ How fresh/accurate is the information?

➤ Technical metadata, which is mostly structured and provides IT technicians the following kinds of information:

   ▪ Format, length, domain, database, and catalog

   ▪ Filters, aggregates, calculations, and expressions

   ▪ Capacity planning, space allocation, indexing, disk utilization, and scheduling.

Implications:

➤ Emphasis on this design principle must be reinforced through appropriate coverage in the SDLC methodology.

➤ Metadata capture and management require the establishment of data stewardship roles in which business components are key participants.

➤ Effective metadata management requires an enhanced understanding of the scope and role of metadata in CMS's information environment.

◆ *Separate transaction processing and analytical support data stores.*

Databases used in batch or online transaction processing operations should have data storage areas that are separate from databases used for analytical processing (e.g., OLAP, or online analytical processing).

Separate data storage isolates operational systems, which perform mission-critical business processing, from large ad hoc queries and recursive analytical processing. If data storage is not separate, ad hoc queries and direct access of data for analytical processing can adversely impact online transactional processing. Performance demands are vastly different for these classes of data stores. There is great difficulty in optimizing the use of resources if they are deployed onto a shared operating platform.

Implications:

➤ Additional platform infrastructure may be needed in order to separate the workload.

➤ Distinctions between the business application requirements of transactional data processing and those of information retrieval processing need to be understood and defined during the design phase.

➤ Business applications providing access to CMS transaction data or analytical support information should perform these operations transparently. Users should be insulated from platform infrastructure considerations.

- ➤ Data design for each type of data structure, transaction processing, or analytical processing may require different database designs for performance optimization. Analytical data stores typically support complex operations involving time series and trend analysis, which do not perform well with relational database technology alone (e.g., sometimes other methods of data storage are needed, such as multi-dimensional databases or flat files).

- ➤ Analytical data stores are typically derived from a stable base of time-variant, non-volatile, historical data (i.e., data warehouse or data mart). CMS's data warehousing data structures and environment are immature and are not enterprise-wide.

◆ *Plan for supporting data in a distributed environment.*

Data structures should support distributed data and metadata access.

Factors such as geographic dispersion, diversity of the data consumer base, and data volumes contribute to CMS's need to operate in a distributed environment. Since data will be distributed on multiple platforms throughout the enterprise, provisions need to be created for supporting data and its associated metadata in a distributed environment.

Implications:

- ➤ Additional platform infrastructure (e.g., network bandwidth, DASD) may be needed to support distributed data and metadata.

- ➤ A distributed environment requires up-front planning and design in order to maintain a high level of data integrity and data quality.

- ➤ The data architecture, through policy and standards, must simplify the management of distributed data and metadata.

◆ *Minimize the data collection burden.*

Only those data elements required to support a specific business need should be collected.

CMS requires the collection of vast amounts of data in order to support program operations, development, and administration. Because of its importance to the enterprise, and its potential burden on the general public and health care industry, data collection should reflect CMS's mission. Project owners should leverage data already collected by other CMS components, or should share data with other federal agencies.

Implications:

- ➤ The large volumes, subject breadth, and source diversity of CMS data pose significant data management challenges, especially in areas of quality and integration.

- ➤ Data standardization, including common terminology, is difficult to achieve, but crucial.

- ➤ Each data element collected should have a steward accountable for data quality.

- ➤ Emphasis on this design principle must be reinforced through appropriate coverage and understanding of business requirements.

- ➤ A directory of CMS's available information assets needs to be established.

◆ *Address issues of document interoperability.*

Documents are no longer simply paper-based or textual information objects. They are information assets that have a life cycle and, as such, require management.

Web technologies, with their embedded hyperlinks, point to both internal and external documents, as well as other digital information objects (i.e., digital images, sound, and video). Both traditional and electronic documents have knowledge and legal value.

Implications:

- ➤ Policies and standards regarding the application of document management technology are required to provide standardization and enable interoperability.

- ➤ Metadata associated with document management has evidentiary significance, since federal courts have ruled that the Federal Records Act requires the record-keeping of electronic objects, communications, and transactions in their electronic form. The electronic records management community has begun work on defining a common set of metadata to satisfy this legal requirement.

- ➤ Trends in document management system standards and alliances (e.g., Document Management Alliance) must be monitored to ensure document interoperability.

- ➤ Trends in related areas of content management should be monitored for convergence, such as web content management, and computer-telephony-integration (CTI) systems.

➤ Integration issues regarding interoperability with metadata repositories are key to CMS's ability to fully leverage its information and, eventually, knowledge assets.

◆ *Support records management requirements.*

Systems development and data collection activities should include processes necessary to support typical records management requirements, such as the following:

➤ Maintaining up-to-date documentation systems documentation that is adequate to

- specify all technical characteristics necessary for reading or processing the records;

- identify all defined inputs and outputs of the system;

- define the contents of the files and records;

- determine restrictions on access and use;

- understand the purpose(s) and function(s) of the system;

- describe update cycles or conditions and rules for adding information to, changing information in, or deleting information from the system; and

- ensure the timely, authorized disposition of the records.

➤ Specifying the location, manner, and media in which electronic records will be maintained to meet operational and archival requirements, and maintaining inventories of electronic information systems to facilitate disposition.

Records are broadly defined by statute and regulation to include all recorded information, regardless of medium or format, generated or received by CMS and its agents under federal law or in connection with the transaction of public business. This includes electronic records generated by electronic mail systems and information systems. Records are appropriate for preservation because of their administrative, legal, fiscal, or informational value. All federal agencies are required to preserve records and documentation pertaining to their organization, function, policies, decisions, procedures, and essential transactions.

Implications:

➤ Agencies are required to integrate the management of electronic records with other records and information resources management programs.

➤ Implications identified for document interoperability are applicable.

➤ Full compliance with National Archives requirements presents potential resource (staff and infrastructure) issues, especially in the area of legacy systems and data.

◆ *Design applications to mimic a business process.*

The logical boundary of an application shall be discrete to the business process it supports and shall remain inviolate.

In doing so, the scope and complexity of each application is contained, thus avoiding the creation of monolithic systems.

Implications:

➤ Discrete business processes must be defined through a rigorous requirements-determination process.

➤ Emphasis on this approach must be reinforced throughout appropriate phases of the SDLC.

➤ Enforcing compliance with this approach may be difficult.

➤ Standards for mapping application logic to business processes must be established.

➤ Programmers and analysts may need additional training in order to understand how to implement applications under this approach.

➤ There may be a specialized role for requirements developers within CMS.

◆ *Layer the design of application.*

The design of applications shall be logically divided into three discrete layers: the user interface layer, the business logic layer, and the data access layer. A messaging interface and a data access middleware interface will provide the method for communication between the logical layers. The logical layers shall not be violated.

This approach produces a loosely coupled, adaptable application design.

Implications:

➤ An increased number of smaller application modules will need to be integrated and managed as a result of this approach.

➤ Training will be needed to improve staff skills with this design approach.

- ➤ There may be a specialized role for application designers and developers within CMS.

- ➤ Rigorous design review throughout the SDLC is the primary enforcement vehicle.

- ➤ There may be a need for organizational realignments to support the layers.

◆ *Use standardized messaging between layers.*

Service request and response mechanisms between application layers shall be standardized and message based.

In layered application design, a higher-level layer requests services from a lower-level layer in order for an application function to execute successfully. Modern techniques for having an application request a service and receive a response involve the use of messaging. The use of standardized messaging formats at each layer simplifies application development.

Implications:

- ➤ Reinforcement of this design approach must be incorporated throughout the SDLC.

- ➤ COTS products are available as standard technologies to implement this approach.

- ➤ Use of object-oriented technologies can facilitate implementation.

◆ *Design for security up front.*

Applications shall be designed and developed to incorporate IT security policies at the beginning and throughout the SDLC.

Security policy cannot be implemented effectively as an afterthought.

Implications:

- ➤ Security service modules are primary candidates for standardized application components.

- ➤ Safeguards and a repository are necessary for shared or common code that implements security.

- ➤ Security requirements may drive how the design of an application is engineered.

◆ *Design applications for reuse.*

Applications shall be designed as modular, loosely coupled, and reusable components.

Reuse of application components simplifies application design, reduces development effort, and, when combined with a layered design approach, accelerates creation of adaptable applications.

Implications:

- ➤ A culture of software reuse must be established among application designers and programmers within CMS.

- ➤ Hardware deployment decisions must be deferred until after application design to avoid imposing artificial design constraints.

- ➤ Reuse of common application components increases the failure risk (fault tolerance) of other applications should coding problems occur.

- ➤ Reuse of shared application services increases exposure to a single point of operational failure.

- ➤ Standards for appropriate levels of granularity for reusable modules must be established.

- ➤ CMS must hire and retain skilled employees and invest in training for existing staff to strengthen programming skills in order to adopt a reuse culture.

- ➤ Emphasis on this approach must be reinforced throughout appropriate phases of the SDLC.

- ➤ Additional effort is needed to establish component libraries for administering reusable modules.

- ➤ Documentation of modules containing reusable functions must be made available (or its existence communicated) to other application designers throughout CMS.

- ➤ There is a potential for a specialized role that would support application designers and developers within CMS. Application designers possessing an overall view of the business process can work with the appropriate specialists during design review.

- ➤ Modules designed for reuse may slightly degrade application performance.

- ➤ Up-front costs to design and develop reusable modules may increase but would provide a return with each subsequent reuse.

- ➤ Appropriate incentives are needed that encourage software reuse among CMS's contractors and operational environments.

◆ *Design applications for portability and platform independence.*

Applications shall be designed for portability and platform independence.

Portability is the ability to deploy (or re-deploy) all or parts of a business application (i.e., user interface, business logic, data access) in the manner most optimal for exploiting available infrastructure resources. Platform independence means that business application logic is not dependent upon the specifics of a particular vendor's hardware or operating system platform.

Implications:

➢ Care must be taken to avoid design constraints that hold CMS business applications to the lowest common denominator hardware platform.

➢ In designing and developing business applications, deployment decisions should be deferred until the implementation phase. Deployment engineers, not application developers, should be responsible for determining the best strategy for platform deployment.

➢ Use of proprietary operating system or hardware extensions must be avoided within the design of business application modules. However, it may be appropriate to use such extensions within the design of specific service modules.

➢ Future business application modules would need to be developed in languages that are platform independent (e.g., C, C++, Java).

CMS has limited experience in languages that are platform independent. Most CMS legacy systems are written in COBOL or M204 User Language, and both of these languages are IBM-MVS operating system dependent. Investments in training that will enable CMS staff to program in C or C++ will be necessary; otherwise, future application development will need to be outsourced.

◆ *Use COTS/GOTS.*

COTS/GOTS products shall be used whenever possible. Custom-developed software may be used instead of commercial/government off-the-shelf products only when warranted and justified.

In cases where a business process is not unique and does not provide competitive advantage, COTS/GOTS products that satisfy CMS's needs are preferable to custom-developed solutions. The implementation of COTS/GOTS products involves less cost and risk compared with custom design and development efforts.

Implications:

➢ COTS/GOTS products normally do not satisfy 100% of business requirements, so some customization is usually needed. The extent, difficulty, and expense of customization must be considered in arriving at make-versus-buy decisions.

➢ Criteria and thresholds for make-versus-buy decisions need to be determined in cases where requirements are not satisfied 100%. How do mandatory versus discretionary requirements influence the decision? Is an 80% satisfaction rate enough?

➢ The stability/continued viability of the vendor offering a COTS/GOTS solution needs to be included in the evaluation criteria for make-versus-buy decisions.

➢ Other pertinent factors in make-versus-buy decisions include CMS's commitment to maintaining the infrastructure to support a given COTS/GOTS product, as well as roles and responsibilities for product support.

➢ The manner in which customization is accommodated within the COTS/GOTS product must be included in the evaluation criteria. Modifying the source code as a means of providing customization is prohibited. In some cases, changing the business process to better take advantage of inherent product capabilities is worth considering.

◆ *Promote the use of web-based technology.*

Web-based technology shall be promoted for use in Agency applications.

The Internet and its associated Web-based technologies and standards have fundamentally and permanently changed the information systems landscape. These technologies have become a ubiquitous, economical, and standards-based resource for worldwide dissemination of and access to information. Web-based technology standards can be applied to transaction processing and information processing application designs. Web browsers have become the standard user interface for distributed business applications.

Implications:

➢ CMS must strengthen the security of its network and database operations environment in order to exploit enterprise use of Web-based technology in application designs.

➢ A Web-based strategy needs to be articulated in the ITA for CMS.

➢ CMS must invest in training for its staff in order to enhance staff skills in designing Web-based business applications and in operating a production systems environment using Web-based technology.

➢ Database management, administration, and security standards and procedures must be assessed to incorporate the expanded use of Web-based technology.

◆ *Enable automated, active information delivery technology.*

The automated, active delivery of information shall be enabled across the enterprise.

Information delivery applications are decision support tools that provide knowledge workers (analysts, researchers) and decision-makers with access to enterprise information. An automated, active information delivery model uses Web-based technology that enables information from databases to be automatically retrieved and delivered to a user's designated location (mailbox, folder, etc.) as soon as the information becomes available. This accelerates decision-making processes because users no longer need to manually request updated information each time that it becomes available.

Implications:

➤ The indiscriminate use of this technology may place heavy demands on the database and network infrastructure.

➤ A strategy must be articulated in the ITA to address appropriate uses of the active information delivery model in conjunction with a "publish and subscribe" model, in which predefined information reports are routinely published and disseminated to users based upon subscriber lists.

➤ CMS has no practical experience with this technology. The Agency must invest in contractor resources and staff training to gain the expertise necessary for effectively implementing this model of information delivery.

➤ Not all applications are candidates for using this information delivery model. Explicit criteria for its use must be defined.

◆ *Separate OLTP from OLAP.*

Online transaction processing (OLTP) applications shall be separated from online analytical processing (OLAP) applications at deployment.

Performance demands are vastly different for these two classes of applications. Great difficulty in optimizing the use of resources is incurred when these types of applications are deployed on a shared operating platform.

Implications:

➤ Additional platform infrastructure may be needed in order to separate the workload.

➤ Distinctions between the business application requirements of transactional data processing and those of information retrieval processing need to be understood and defined during the design phase.

➤ Business applications providing access to CMS transaction data or decision support information should perform these operations transparently. Users should be insulated from platform infrastructure considerations.

◆ *Design OLAP to use data warehousing.*

Data warehouse concepts shall be leveraged to reduce the burden of development and to accelerate decision-making.

Data warehousing has matured in methodology such that IT solutions can be acquired and deployed using COTS products and little custom programming. Doing so reduces CMS's level of effort and accelerates the provision of IT solutions for decision support.

Implications:

➤ An enterprise-wide data warehouse methodology and strategy must be defined for CMS.

➤ Information subject areas contained within CMS's data warehouse, as well as access methods, must be specified, communicated, and made available enterprise-wide.

➤ Methodologies, disciplines, tools, and techniques for implementing data warehousing differ from those used for transaction processing applications. Specialized skills, roles, and training for CMS staff will be needed.

➤ Information engineering and data administration are essential to success.

◆ *Design for n-tier client/server.*

Applications shall be implemented using an n-tier client/server model.

Adaptable applications have a modular, layered, and loosely coupled design and are deployed onto a distributed computing infrastructure. Maximum adaptability is achieved when implementing an n-tier client/server model.

Implications:

➤ Knowledge and expertise in designing and implementing n-tier client/server applications must be acquired to assist CMS.

➤ Technology for effectively deploying and managing n-tier client/server systems within CMS's distributed computing environment is needed.

➤ Pertinent development and deployment standards must be identified. Design templates and software module templates would facilitate the establishment of standards across the enterprise.

➤ Additional investments in client/server technology infrastructure may be needed.

➤ More time may be needed for technical staff to adjust to the change from conventional design approaches. Proposed project schedules should account for this potentiality.

➤ Technical design and development reviews should include assessment criteria for adherence to this approach.

➤ Not all projects may need to adopt this approach. Appropriate criteria should be established to determine when this approach is warranted.

➤ Significant effort will be required to plan and carry out the transition or reengineering of legacy systems under this concept.

◆ *Use standard methods.*

Standard application development methods shall be adopted.

Standard methods for application design and development help to ensure interoperability and access to enterprise information by business applications throughout CMS.

Implications:

➢ Different types of business needs and different types of applications developed to access information warrant different standards for application development. More than one application development standard (methodology) is needed within CMS.

➢ Appropriate methodologies must be identified for application development within CMS. The current standard (CMS Information Systems Development Guide) must be made current, as it is no longer viable for serving this purpose.

➢ Training will be necessary in order to prepare staff to accept an improved methodology, particularly if more than one is adopted.

➢ Rigor in enforcing any new methodology must be tempered by the need for CMS to gain experience through its continual use.

◆ *Use prototypes and pilots.*

Prototypes and pilots shall be used to achieve a working system first.

Prototypes and pilots are alternative means of exploring the appropriateness and feasibility of employing technology within CMS while minimizing the level of effort, cost, and risk associated with deployment. Prototypes are proof-of-concept IT projects of limited scale and scope that are used to assess the technical feasibility of a custom-developed business application solution. Pilots are limited scale, initial deployments of IT solutions and are designed to prove the viability of an application for a specific business purpose. Prototypes are typically unnecessary for COTS business applications. Pilots may employ all custom-developed applications, all COTS applications, or combinations of both. Rapid Application Development (RAD) methods and tools facilitate the design and development of prototypes.

Implications:

Prototypes have a way of becoming the "production" implementation once they are proven to satisfy a given need. Considering that adaptability is an essential concept to be achieved through the Application Architecture, a formal prototyping process should be incorporated into the CMS SDLC.

Chapter 3
Business Architecture

The business architecture represents the functions and processes that support the business, the organizations that perform the business, the locations where the business is performed, and the factors that could cause the business to change. In other words, the business architecture addresses how the mission-critical functions of the organization are accomplished. It is a portrayal of how the organization actually accomplishes its mission rather than how it is organizationally structured to manage its mission. The business architecture also encompasses a strategic direction that an organization strives to attain. Major influences on the business architecture are laws and regulations, external and internal policies, organizational structures, organizational culture, business change, people, budgets, and technology drivers. This layer ignores any physical constraints and contains no element of system design.

This chapter provides a high-level business architecture depicting and describing the functional areas and functions performed by CMS. The chapter begins with functional hierarchy diagrams and descriptions of CMS's functional areas and functions. It then describes CMS's organizational structure and identifies which organizational entities perform the business functions.

CMS'S FUNCTIONAL HIERARCHY

CMS's functional hierarchy identifies major business functional areas and functions. A functional area is a classification for a logical grouping of related business activities such that it supports or accomplishes an aspect of CMS's mission and vision. A function is a logical grouping of related business activities such that it further defines the functional area in which it belongs. Functions define "what" but not "how" these activities are performed.

Table 3-1 lists CMS's functional areas and identifies the strategic objective categories associated with each. Figure 3-1 depicts the functional areas.[1]

Table 3-1. Strategic Objective Categories Associated with Functional Areas

Functional area	Program administration	Quality of care	Customer service
1. Manage CMS administrative processes	X		
2. Develop programs	X		X
3. Manage program operations	X	X	X
4. Manage Medicare finances	X		
5. Manage program integrity operations	X	X	
6. Administer Medicaid and SCHIP	X	X	X
7. Manage CMS relationships	X		X
8. Provide administrative services	X		
9. Manage outreach and education	X		X
10. Manage or participate in health industry standard development	X		X
11. Manage program quality	X	X	

Note: The data in this table are from HCFA IT Architecture, Version 2.0, Volume 2.

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[1] All of the functional areas and functions are from the HCFA IT Architecture, Version 2.0, Volume 2. November 1999.

Figure 3-1. CMS Functional Areas

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                              ┌──────────────┐
                              │ Ensure health│
                              │ care programs│
                              │ and services │
                              └──────┬───────┘
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| ○●○ 1. Manage CMS administrative processes | ○●○ 2. Develop programs | ○●○ 3. Manage program operations | ○●○ 4. Manage Medicare finances | ○●○ 5. Manage program integrity operations | ○●○ 6. Administer Medicaid and SCHIP | ○●○ 7. Manage CMS relationships | ○●○ 8. Provide administrative services | ○●○ 9. Manage outreach and education | ○●○ 10. Manage or participate in health industry standard development | ○●○ 11. Manage program quality |

Note: The pattern of three circles above each functional area indicates that a a lower level diagram exists for that functional area. These diagrams appear on the following pages.

CMS's functional areas are defined as follows:

1. Manage CMS administrative processes—functions necessary to establish agency direction, manage agency personnel, and evaluate the overall effectiveness of the agency's programs.

2. Develop programs—functions necessary to effectively develop policy and monitor the implementation of that policy for CMS's health care insurance program responsibilities.

3. Manage program operations—functions necessary to manage CMS programs. This includes determining if individuals, providers, and managed care organizations initially meet, and continue to meet, the requirements for participating in CMS-administered programs; managing contractors (Medicare, PRO, and End Stage Renal Disease, or ESRD, networks, call center contractors, specialty contractors, and external appeals entities); pricing and processing Medicare claims/encounter data; and handling beneficiary appeals, grievances, and complaints.

4. Manage Medicare finances—functions necessary to determine and monitor Medicare contractor budgets, collect premiums and debts, handle Medicare contractor bank accounts, manage provider financial matters and cost reports, and reimburse managed care organizations.

5. Manage program integrity operations—functions necessary to ensure that CMS-administered programs achieve and maintain a high degree of integrity. This constitutes both pre- and post-payment program integrity assessment procedure development and post-payment program integrity functions.

6. Administer Medicaid and SCHIP—functions necessary to administer the Medicaid program and State Child Health Insurance Program (SCHIP).

7. Manage CMS relationships—functions necessary to maintain working relationships with external organizations and individuals such as Congress, the media, the public, State and local governments, other U.S. government agencies and academic institutions, health care providers, and the health care industry.

8. Provide administrative services—functions necessary to provide common services in support of CMS's mission.

9. Manage outreach and education—functions necessary for communication with program beneficiaries, recipients, providers, and partners.

10. Manage or participate in health industry standard development—functions necessary to work with industry in developing industry-wide standards to ensure that the health care needs of Americans are appropriately considered.

11. Manage program quality—functions necessary to monitor and improve the quality of health care provided to, and the health status of, beneficiaries participating in CMS-administered programs.

In the following subsections, we provide diagrams depicting the functions within each functional area, as well as definitions of the functions.

1. Manage CMS Administrative Processes
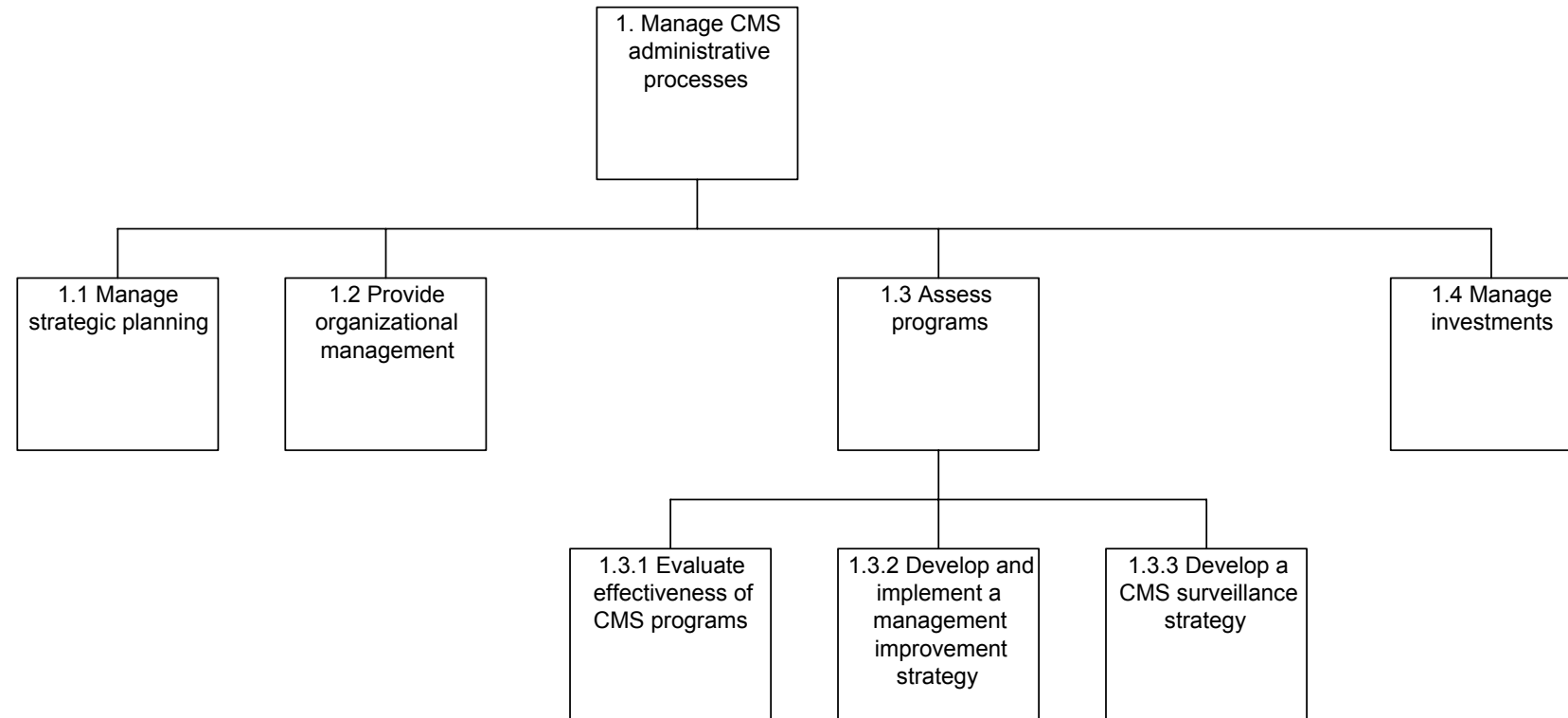
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                      ┌─────────────────┐
                      │  1. Manage CMS  │
                      │ administrative  │
                      │   processes     │
                      └────────┬────────┘
          ┌────────────┬───────┴───────┬─────────────┐
  ┌───────┴──────┐ ┌───┴────────┐ ┌────┴──────┐ ┌────┴──────┐
  │ 1.1 Manage   │ │1.2 Provide │ │1.3 Assess │ │1.4 Manage │
  │ strategic    │ │organizational│ │ programs │ │investments│
  │ planning     │ │management  │ │           │ │           │
  └──────────────┘ └────────────┘ └────┬──────┘ └───────────┘
                       ┌────────────────┼────────────────┐
                 ┌─────┴──────┐ ┌───────┴──────┐ ┌────────┴────┐
                 │1.3.1 Evaluate│ │1.3.2 Develop and│ │1.3.3 Develop a│
                 │effectiveness of│ │implement a    │ │CMS surveillance│
                 │CMS programs │ │management      │ │strategy      │
                 │            │ │improvement     │ │             │
                 │            │ │strategy        │ │             │
                 └────────────┘ └────────────────┘ └─────────────┘
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1. Manage CMS administrative processes—functions necessary to establish agency direction, manage agency personnel, and evaluate the overall effectiveness of the agency's programs.

1.1 Manage strategic planning—identify, prioritize, schedule, and implement the agency's missions, goals, and project initiatives.

1.2 Provide organizational management—assign program/project responsibilities, perform employee management, and develop and implement CMS personnel policies.

1.3 Assess programs—evaluate the effectiveness of CMS's programs and missions. This includes overseeing organizations to which CMS has delegated responsibilities and functions, and training CMS staff members to ensure that their level of knowledge is sufficient to administer CMS programs.

1.3.1 Evaluate effectiveness of CMS programs—collect and analyze data and information to determine the extent to which CMS is achieving the greatest amount of success possible from agency initiatives (e.g., quality projects and contractor claims processing).

1.3.2 Develop and implement a management improvement strategy—develop and implement a strategy that will achieve the greatest success in the management of CMS's initiatives based on the results of the program evaluation.

1.3.3 Develop a CMS surveillance strategy—develop an integrated approach to surveillance of beneficiary health status.

1.4 Manage investments—manage CMS's investments, such as technology and productivity investments.

2. Develop Programs

2. Develop programs

- 2.1 Manage partner relationship policy development
  - 2.1.1 Develop policies for contracts, grants, and agreements
- 2.2 Provide actuarial services
- 2.3 Manage Medicare beneficiary enrollment policy development
  - 2.3.1 Develop policy for Medicare beneficiary enrollment in Managed Care Organizations (MCOs)
  - 2.3.2 Develop MCO payment policy
- 2.4 Manage Medicaid/SCHIP beneficiary eligibility policy development
- 2.5 Manage payment policy development
- 2.6 Manage coverage policy development
- 2.7 Manage program data and statistics
  - 2.7.1 Identify quality of care indicators for the PRO program
- 2.8 Manage research and evaluation
- 2.9 Manage demonstration projects
  - 2.9.1 Perform PRO special study activities
- 2.10 Manage legislative activities and regulation development
- 2.11 Manage Medicare claims appeals,grievances and complaints policy development
- 2.12 Manage quality of care/utilization review policy development
  - 2.12.1 Develop policies for mandatory case review performed by Peer Review Organizations (PROs)
  - 2.12.2 Develop policy for beneficiary rights outreach and educational activities
- 2.13 Manage program integrity policy development
  - 2.13.1 Coordinate Medicare Managed Care Organization program integrity policy
  - 2.13.2 Guide Medicaid/SCHIP program integrity policy for States
- 2.14 Manage policy development for participation of providers

2. Develop programs—functions necessary to effectively develop policy and monitor the implementation of that policy for CMS's health care insurance program responsibilities.

2.1 Manage partner relationship policy development—formulate and write policy defining the relationships between CMS and other entities that participate in CMS-administered programs.

2.1.1 Develop policy for contracts, grants, and agreements—formulate and write policies for developing contracts, grants, and other types of agreements for CMS to partner with outside entities to carry out CMS-administered programs, as well as establishing relationships between CMS's partners and their external partners.

2.2 Provide actuarial services—develop and use methodologies for macroeconomic analysis of health care financing issues and estimate CMS program expenditures under current law and under proposed modifications to current law. The setting of premiums and program payment rates is also included.

2.3 Manage Medicare beneficiary enrollment policy development—formulate, write, interpret, evaluate, and monitor program policies pertaining to the conditions under which individuals meet the criteria for enrollment in Medicare program service delivery options.

2.3.1 Develop policy for Medicare beneficiary enrollment in Managed Care Organizations (MCOs)—formulate and write policy related to enrollment and disenrollment of beneficiaries in MCOs.

2.3.2 Develop MCO payment policy—develop policy for the calculation of payments to MCOs and the development of beneficiary-level risk adjusters.

2.4 Manage Medicaid/SCHIP beneficiary eligibility policy development—formulate, write, interpret, evaluate, and monitor program policies pertaining to the conditions under which individuals are eligible for Medicaid or the State Children's Health Insurance Program.

2.5 Manage payment policy development—formulate, monitor, and evaluate national policy for payments and payment dispute resolution for health insurance programs that CMS oversees and administers.

2.6 Manage coverage policy development—formulate, write, evaluate, and review national policies and standards concerning the items and services covered under CMS-administered programs and national policies concerning the resolution of disputes over access to covered items and services.

2.7 Manage program data and statistics—plan, direct, and manage the collection and analysis of data and the production of statistics on CMS-administered programs for internal and external users.

2.7.1 Identify quality of care indicators for the PRO program—identify quality-of-care indicators for clinical areas to be addressed by the PROs. These indicators also will be used as baseline data for evaluating PRO performance.

2.8 Manage research and evaluation—direct the development and conduct of research and evaluation studies concerning the impact of federal financing programs on the health care industry, program beneficiaries, and expenditures.

2.9 Manage demonstration projects—manage enrollment in and development, implementation, and monitoring of experiments testing health care delivery and payment alternatives, demonstrations, and special studies.

2.9.1 Perform PRO special study activities—review and approve, deny, or suggest changes to PRO proposals to perform a special study, and oversee the study once awarded. This includes the development and review of concept papers for a special study proposal developed by the CMS staff and the selection of the appropriate PROs to perform the approved study.

2.10 Manage legislative activities and regulation development—monitor federal and State legislation with regard to its effects on CMS-administered programs. Included in this function are the collection and analysis of data; development of legislative proposals; development of responses to proposed legislation; communication with the legislative and regulatory originators; and formulation of CMS regulations and manuals, including any necessary notification and educational activities.

2.11 Manage Medicare claims appeals, grievances and complaints policy development—develop, interpret, evaluate, and monitor program policies pertaining to the resolution of appeals and complaints resulting from a denial of beneficiary access to covered services or of beneficiary payment for covered services already received.

2.12 Manage quality of care/utilization review policy development—formulate and write policy relative to the quality of care given by health care providers participating in CMS-administered programs.

2.12.1 Develop policies for mandatory case review performed by Peer Review Organizations (PROs)—establish policies related to mandatory case reviews, including those involving beneficiary complaints, referrals, assistance at cataract

surgery, Emergency Medical Treatment and Active Labor Act violations, non-coverage notices, medical necessity, 96-hour extended stays, sanction recommendation development, and requests for higher-weighted diagnosis-related groups (DRGs).

2.12.2 Develop policy for beneficiary rights outreach and educational activities—formulate policy with regard to beneficiary rights outreach and education. This includes participation in local meetings on preventive medicine, distribution of beneficiary rights materials, and other educational activities.

2.13 Manage program integrity policy development—formulate and write policy relative to the detection of fraud, waste, and abuse by providers participating in CMS-administered programs.

2.13.1 Coordinate Medicare Managed Care Organization program integrity policy—formulate and write policies that reduce fraud, waste, and abuse associated with health care services provided by managed care organizations.

2.13.2 Guide Medicaid/SCHIP program integrity policy for states—formulate and write policies that guide and assist States in the implementation of Medicaid and SCHIP program integrity initiatives. This includes development of State Medicaid director letters, regulations, proposed legislation, and other policy-related activities, as well as liaison activities for implementing the policies.

2.14 Manage policy development for participation of providers—formulate, write, interpret, and evaluate program policies pertaining to the conditions under which providers (including hospitals, skilled nursing facilities, home health agencies, clinical laboratories, physicians, therapists, and other entities providing health care services to beneficiaries) meet the criteria for participating in CMS-administered programs.

3. Manage Program Operations

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                                          ┌──────────────────┐
                                          │ 3. Manage program│
                                          │    operations    │
                                          └──────────────────┘
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3.1 Maintain Medicare beneficiary enrollment
- 3.1.1 Enroll beneficiaries in MCOs and demonstrations
- 3.1.2 Disenroll beneficiaries in MCOs and demonstrations

3.2 Manage Medicaid and SCHIP entitlement/eligibility and maintenance

3.3 Manage provider enrollment

3.4 Determine managed care organizations eligibility
- 3.4.1 Process managed care organization applications
- 3.4.2 Review Adjusted Community Rating (ACR) proposals
- 3.4.3 Qualify and administer managed care organization contracts

3.5 Manage Medicare contractors
- 3.5.1 Evaluate contractor performance

3.6 Manage peer review and ESRD network contractors
- 3.6.1 Award and maintain contracts with PROs
- 3.6.2 Monitor and evaluate PRO performance
- 3.6.3 Serve as technical advisor to support PROs
- 3.6.4 Monitor mandatory case review activities performed by PROs
- 3.6.5 Monitor PRO activities relative to beneficiary rights outreach and education
- 3.6.6 Monitor activities relative to the payment error prevention program

3.7 Process Medicare claims

3.8 Manage claims pricing

3.9 Oversee State health insurance

3.10 Coordinate benefits

3.11 Process Medicare appeals, grievances, and complaints
- 3.11.1 Process appeals of managed care organization claims
- 3.11.2 Hear provider protests

3. Manage program operations—functions necessary to manage CMS programs. This includes determining if individuals, providers, and managed care organizations initially meet, and continue to meet, the requirements for participating in CMS-administered programs; managing contractors (Medicare, PRO, and End Stage Renal Disease, or ESRD, networks, call center contractors, specialty contractors, and external appeals entities); pricing and processing Medicare claims/encounter data; and handling beneficiary appeals, grievances, and complaints.

3.1 Maintain Medicare beneficiary enrollment—establish and maintain Medicare beneficiary records and coordinate enrollment in Medicare program options for individuals entitled to Medicare benefits. This function includes receipt and maintenance of Medicare entitlement and demographic information from the Social Security Administration, Railroad Retirement Board, and Office of Personnel Management, as well as enrollment, disenrollment, and change data for beneficiary elections of appropriate service delivery and payment options.

3.1.1 Enroll beneficiaries in MCOs and demonstrations—enroll Medicare beneficiaries in managed care organizations. The process includes validating the beneficiary's eligibility to enroll in the MCO; annotating CMS records; generating confirmation and denial reports and notices; and, when appropriate, generating lock-in notices and/or initiating the termination of the beneficiary from another MCO.

3.1.2 Disenroll beneficiaries in MCOs and demonstrations—terminate enrollment of a Medicare beneficiary in a managed care organization. The process includes validating the beneficiary's eligibility status for disenrollment from the MCO; annotating the records; generating a notice to the beneficiary and confirmation/denial reports; and, when appropriate, initiating the process of "rolling over" a beneficiary to another MCO.

3.2 Manage Medicaid and SCHIP entitlement/eligibility and maintenance—establish and maintain Medicaid entitlement and SCHIP eligibility records and monitor entitlement/eligibility for individuals covered under Medicaid and SCHIP.

3.3 Manage provider enrollment—identify, verify, and register physicians, suppliers, non-physician practitioners, and institutional providers for purposes of billing under the Medicare program. This function compiles and maintains information relating to such entities and ensures that applicants and current participants meet the specific statutory, regulatory, and policy requirements. This includes desk review analysis, on-site verification, development of specialty reports, issuance of findings, preparation of determination recommendation, corrective action review, and enforcement.

3.4 Determine managed care organizations eligibility—determine whether organizations initially meet the specific provisions for participation in federal managed care organizations. This includes organizations that seek federal qualification and/or Medicare contractual agreements. This results in either the issuance of a federal qualification approval certificate or a determination of eligibility or ineligibility.

3.4.1 Process managed care organization applications—review and approve applications and service area expansion applications. This includes conducting site visits, and determining eligibility or ineligibility, and issuing federal qualification approval certificates.

3.4.2 Review Adjusted Community Rating (ACR) proposals—review and approve ACR proposals.

3.4.3 Qualify and administer managed care organization contracts—establish and interpret contract policy, prepare recommendations for contract approval or disapproval, coordinate MCO-initiated non-renewal, and prepare recommendations for contract termination.

3.5 Manage Medicare contractors—establish contracts and manage Medicare contractor workloads and transition, develop and communicate contractor requirements, and evaluate contractor performance. This process also includes contractor management of the Medicare fiscal contractors, specialty contractors, call center contractors, and other contractors associated with payment of Medicare claims, as well as MCOs.

3.5.1 Evaluate contractor performance—collect and analyze data on each contractor to determine if the contractor is performing effectively. In the case of PROs, this includes the collection of both cost and clinical measures.

3.6 Manage peer review and ESRD network contractors—coordinate, implement, and manage the peer review and ESRD network contractors.

3.6.1 Award and maintain contracts with PROs—develop a request for contract, analyze a contract proposal, conduct negotiations, track contracting activities, modify existing contracts, and analyze contract modification proposals for the PRO program.

3.6.2 Monitor and evaluate PRO performance—monitor compliance with PRO contract requirements, which includes tracking the status of national Quality Improvement Projects (QIPs) and local QIPs, and providing guidance on concepts for local QIPs. This also includes developing and executing a strategy for monitoring compliance of PROs relative to conducting mandatory case reviews, and performing beneficiary rights outreach and education. In addition, this process includes the collection of both cost and clinical measures to determine if the PRO is performing effectively.

3.6.3 Serve as technical advisor to support PROs—support the PROs in their work in accordance with the scope of their contract.

3.6.4 Monitor mandatory case review activities performed by PROs—determine if mandatory case review is being conducted as specified by policy and is resulting in the desired outcome.

3.6.5 Monitor PRO activities relative to beneficiary rights outreach and education—monitor PRO performance with regard to beneficiary rights outreach and educational activities.

3.6.6 Monitor activities relative to the payment error prevention program—monitor the activities performed by the PROs to reduce the payment error rate. This process also includes reviewing reports submitted by the PROs about the types of interventions and processes they are using in targeting providers for error reduction.

3.7 Process Medicare claims—manage, validate, and determine payable amounts for Medicare claims; handle exceptions (non-MR, non-Medicare Secondary Payer, or MSP); exchange claims data with insurance trading partners; and maintain claims history information. This process also includes the actual processing of claims, as well as managing encounter data and claims data (claims processing is currently performed by Medicare claims processing contractors).

3.8 Manage claims pricing—create and maintain required reasonable charge screens, fee schedules, and other pricing determination mechanisms.

3.9 Oversee State health insurance—oversee State health insurance programs.

3.10 Coordinate benefits—establish relationships with insurance companies for the purpose of exchanging claims information. This includes negotiating, receiving, and maintaining Coordination of Benefits agreements.

3.11 Process Medicare appeals, grievances, and complaints—handle appeals related to enforcement of CMS decisions about payment of claims, participation in CMS-administered programs, and other decisions that might have a negative impact on our partners or beneficiaries.

3.11.1 Process appeals of managed care organization claims—collect, maintain, and analyze information, and make decisions related to adverse MCO claims determinations and reconsiderations.

3.11.2 Hear provider protests—hear cases related to protests over participation in agency programs filed by CMS-administered program providers, including hospitals, skilled nursing facilities, home health agencies, clinical laboratories, physicians, therapists and other covered entities providing health care services, as well as by those applying to become approved providers.

4. Manage Medicare Finances
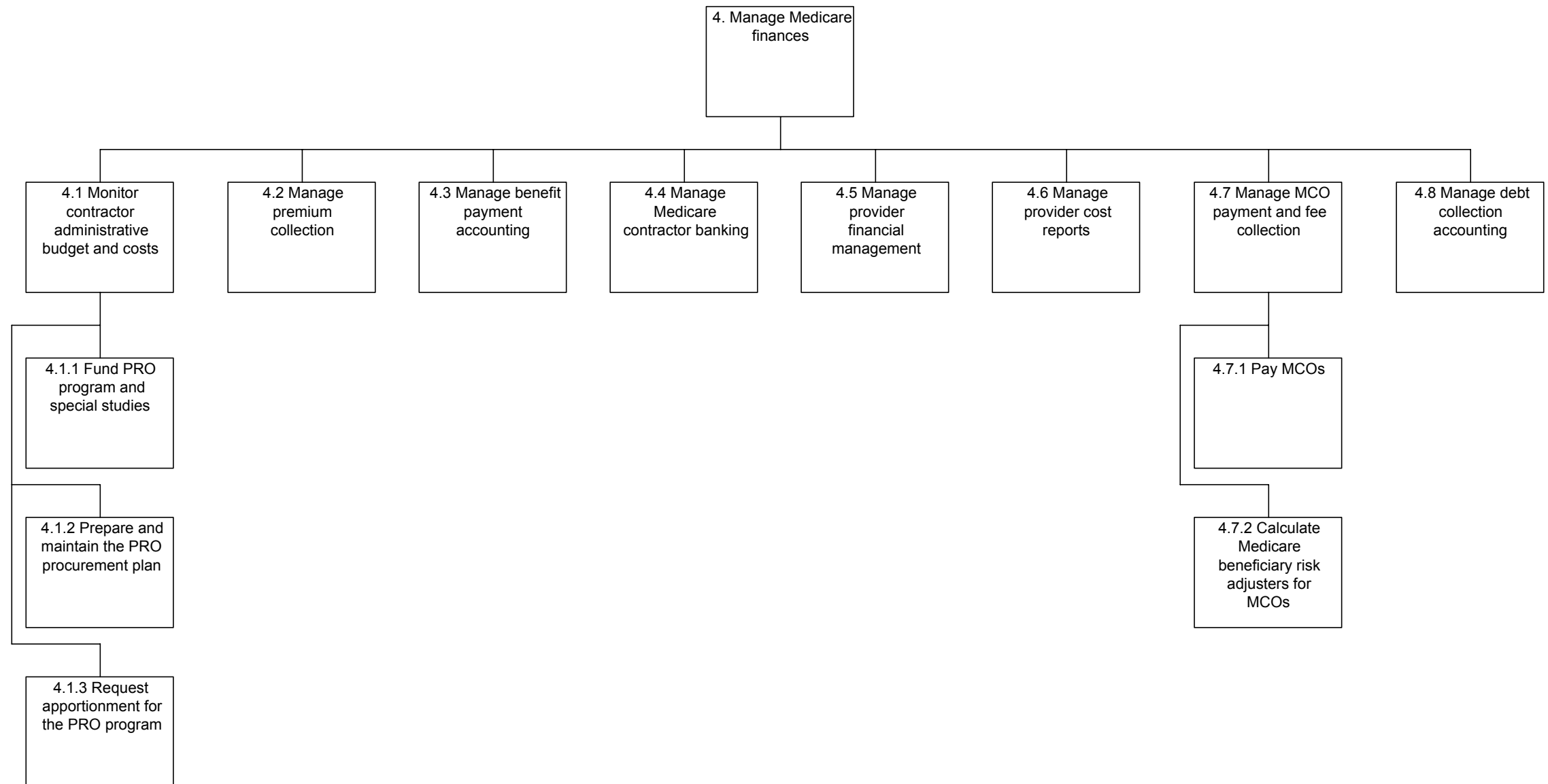
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                              ┌─────────────────┐
                              │ 4. Manage Medicare │
                              │    finances      │
                              └─────────────────┘
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| 4.1 Monitor contractor administrative budget and costs | 4.2 Manage premium collection | 4.3 Manage benefit payment accounting | 4.4 Manage Medicare contractor banking | 4.5 Manage provider financial management | 4.6 Manage provider cost reports | 4.7 Manage MCO payment and fee collection | 4.8 Manage debt collection accounting |

4.1.1 Fund PRO program and special studies

4.1.2 Prepare and maintain the PRO procurement plan

4.1.3 Request apportionment for the PRO program

4.7.1 Pay MCOs

4.7.2 Calculate Medicare beneficiary risk adjusters for MCOs

4. Manage Medicare finances—functions necessary to determine and monitor Medicare contractor budgets, collect premiums and debts, handle Medicare contractor bank accounts, manage provider financial matters and cost reports, and reimburse managed care organizations.

4.1 Monitor contractor administrative budget and costs—develop contractor/State/quality organization budgets and administer funds after budget approval. This function includes annual budget development and submission, as well as the on-going tracking and reporting of expenditures.

4.1.1 Fund PRO program and special studies—appropriately fund a PRO by producing a cost estimate, managing fund distribution and expenditures, and monitoring program costs.

4.1.2 Prepare and maintain the PRO procurement plan—ensure that PRO expenditures are appropriate and do not exceed available funds.

4.1.3 Request apportionment for the PRO program—develop a request for funds from MB to operate the PRO.

4.2 Manage premium collection—manage the collection of Hospital Insurance and Supplementary Medical Insurance premiums for Medicare from third parties or directly from beneficiaries who do not receive monthly Social Security benefits.

4.3 Manage benefit payment accounting—manage accounts payable and accounts receivable, manage cash, and document payment for the Medicare program.

4.4 Manage Medicare contractor banking—establish bank accounts, manage accounts, and control funds flowing through those accounts.

4.5 Manage provider financial management—analyze financial information to determine periodic interim payments, pass-through payments, and advance or accelerated payments, and produce provider-specific reports reflecting interim and final payments. This function also includes the processes needed to recover overpayments made to providers.

4.6 Manage provider cost reports—receive, process, perform audits of, and resolve cost reports for providers who are reimbursed based on reasonable costs or prospective payment.

4.7 Manage MCO payment and fee collection—certify and monitor Medicare payments and collect user fees.

4.7.1 Pay MCOs—generate monthly payments to managed care organizations participating in the Medicare program, including the computation of beneficiary-specific rates, the calculation of beneficiary adjustments, and the calculation of user fees. This also includes the calculation of payment for distribution of payments into a beneficiary's medical savings account.

4.7.2 Calculate Medicare beneficiary risk adjusters for MCOs—calculate the risk adjuster for each Medicare beneficiary enrolled in a managed care organization.

4.8 Manage debt collection accounting—manage and recover mistaken/conditional payments to providers, MCOs, physicians, and other Medicare providers, including those mistaken/conditional payments resulting from medical review; fraud, waste, and abuse detection; Medicare secondary payer review; provider audits; or other detection methods

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5. Manage Program Integrity Operations
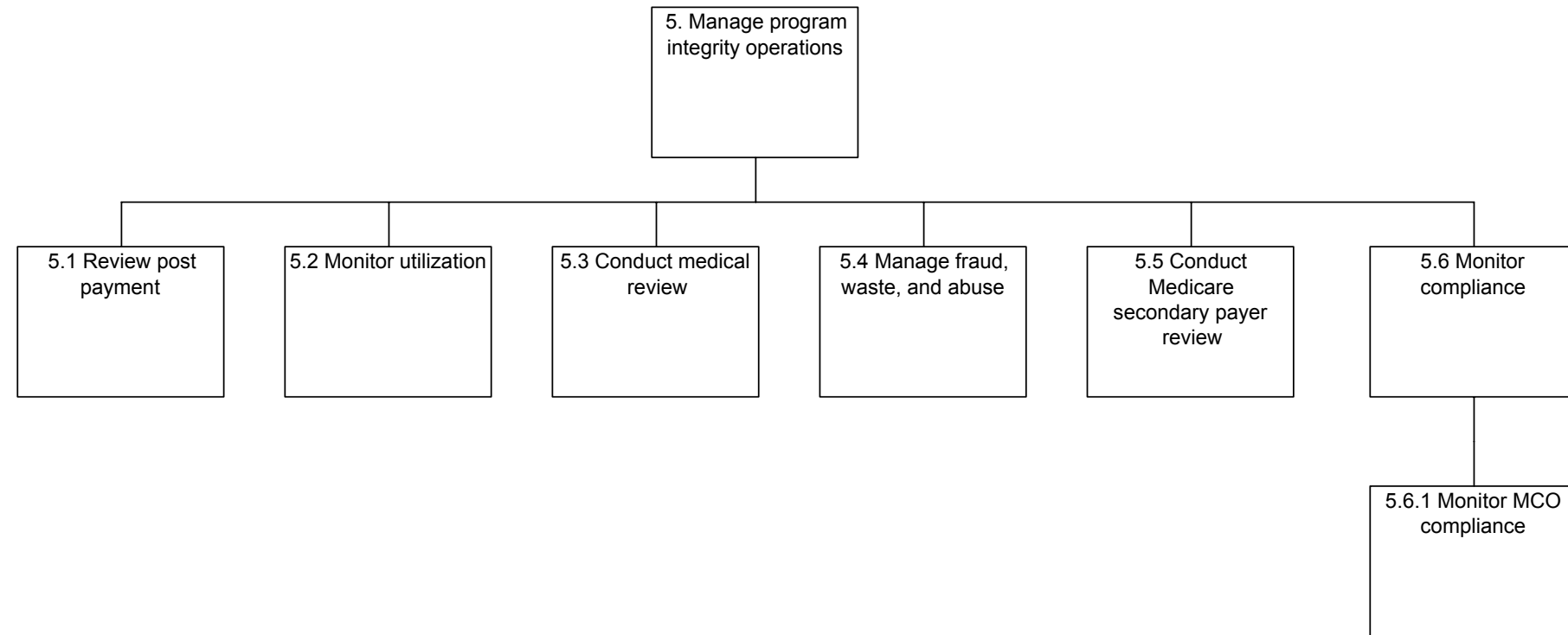
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                        ┌─────────────────┐
                        │ 5. Manage program│
                        │ integrity operations│
                        └─────────────────┘
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| 5.1 Review post payment | 5.2 Monitor utilization | 5.3 Conduct medical review | 5.4 Manage fraud, waste, and abuse | 5.5 Conduct Medicare secondary payer review | 5.6 Monitor compliance |

5.6.1 Monitor MCO compliance

5. Manage program integrity operations—functions necessary to ensure that CMS-administered programs achieve and maintain a high degree of integrity. This constitutes both pre- and post-payment program integrity assessment procedure development and post-payment program integrity functions.

5.1 Review post payment—determine the accuracy and timeliness of Medicare payments to providers and other entities. This includes reviewing cost-based, prospective, and alternative payment systems, and overseeing Part B payments calculated using the reasonable charge methodology.

5.2 Monitor utilization—administer utilization review of inpatient, post-hospital, out-patient, physician, provider, and ancillary care claims. This function also includes performing quality assurance for claims processing, as well as monitoring encounter data elements from managed care organizations.

5.3 Conduct medical review—ensure that payments are made only for services that are covered by Medicare and are correctly coded. This function includes reviewing both claims and encounter data.

5.4 Manage fraud, waste, and abuse—provide fraud, waste, and abuse prevention information; respond to internal and external customer complaints of alleged fraud, waste, or abuse; identify and investigate alleged fraudulent, wasteful, or abusive activities; and provide incentives/rewards to those who identify possible fraud, waste, or abuse. This function also includes promoting fraud awareness; implementing sanctions; assisting States with Medicaid and SCHIP fraud, waste, and abuse prevention; and developing strategies for sharing information among CMS-administered programs.

5.5 Conduct Medicare secondary payer review—identify beneficiaries that have coverage primary to Medicare.

5.6 Monitor compliance—identify, track, and/or enforce procedures and activities aimed at ensuring and improving provider and MCO compliance with program requirements.

5.6.1 Monitor MCO compliance—verify that a managed care organization is operating in compliance with CMS's program requirements. This includes visiting sites, conducting audits, enforcing sanctions, and implementing corrective-action plans.

6. Administer Medicaid and SCHIP
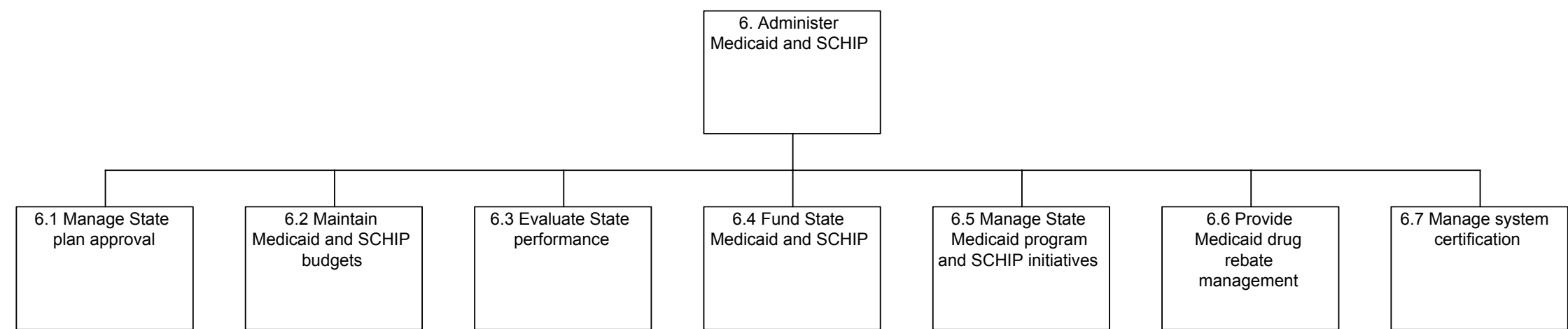
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                          │   6. Administer      │
                          │ Medicaid and SCHIP   │
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6.1 Manage State plan approval	6.2 Maintain Medicaid and SCHIP budgets	6.3 Evaluate State performance	6.4 Fund State Medicaid and SCHIP	6.5 Manage State Medicaid program and SCHIP initiatives	6.6 Provide Medicaid drug rebate management	6.7 Manage system certification

6. Administer Medicaid and SCHIP—functions necessary to administer the Medicaid program and State Child Health Insurance Program.

6.1 Manage State plan approval—establish the State Medicaid plan and SCHIP approval process and execute that process.

6.2 Maintain Medicaid and SCHIP budgets—monitor State Medicaid and SCHIP budgets and develop federal Medicaid and SCHIP budgets.

6.3 Evaluate State performance—evaluate State Medicaid and SCHIP performance.

6.4 Fund State Medicaid and SCHIP—supply funds to the State Medicaid and SCHIP programs.

6.5 Manage State Medicaid program and SCHIP initiatives—provide States with information on the benefits of improving their Medicaid and SCHIP programs.

6.6 Provide Medicaid drug rebate management—establish drug rebate agreements, determine drug rebate amounts, and monitor utilization of the drug rebate program.

6.7 Manage system certification—review and approve State Medicaid management information systems.

7. Manage CMS Relationships
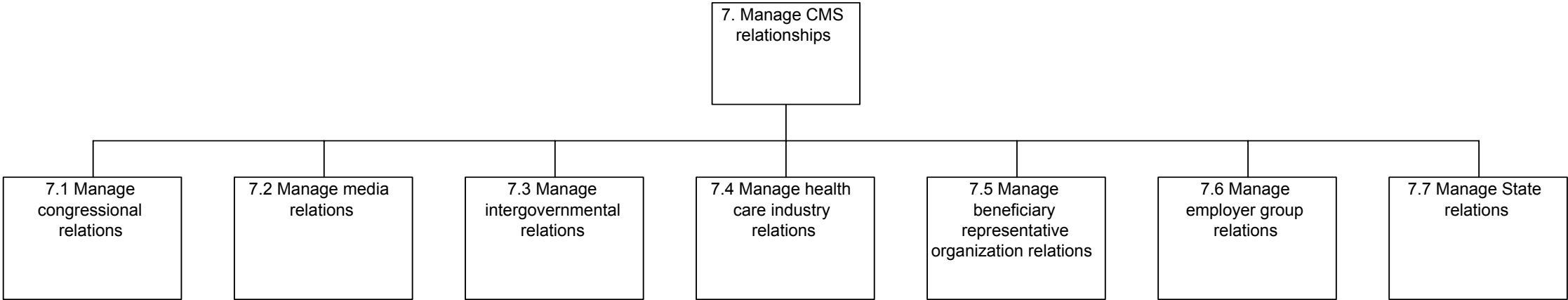
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                              ┌─────────────────┐
                              │  7. Manage CMS  │
                              │  relationships  │
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| 7.1 Manage congressional relations | 7.2 Manage media relations | 7.3 Manage intergovernmental relations | 7.4 Manage health care industry relations | 7.5 Manage beneficiary representative organization relations | 7.6 Manage employer group relations | 7.7 Manage State relations |

7. Manage CMS relationships—functions necessary to maintain working relationships with external organizations and individuals such as Congress, the media, the public, State and local governments, other U.S. government agencies and academic institutions, health care providers, and the health care industry.

7.1 Manage congressional relations—provide information, interpretation, and analysis services regarding congressional activities related to CMS-managed programs. This includes developing responses, background information, and bill reports.

7.2 Manage media relations—maintain relationships with the media, including press, radio, television, wire services, individual reporters, editors, publishers, producers, writers, broadcasters, and any private- or public-sector partners.

7.3 Manage intergovernmental relations—provide intergovernmental communication and coordination of issues pertinent to CMS.

7.4 Manage health care industry relations—provide liaison with medical, dental, and allied health practitioners; institutional providers of health services; representatives of the business and insurance community; and academic institutions responsible for the education of health care professionals.

7.5 Manage beneficiary representative organization relations—provide liaison with national, State, or local organizations that counsel, advocate, represent, or educate beneficiaries on CMS-administered programs.

7.6 Manage employer group relations—provide liaison to companies or corporations with whom CMS exchanges information to assist in the education of employees and retirees on health insurance plans.

7.7 Manage State relations—provide the States with communication and coordination of issues pertinent to CMS.

8. Provide Administrative Services
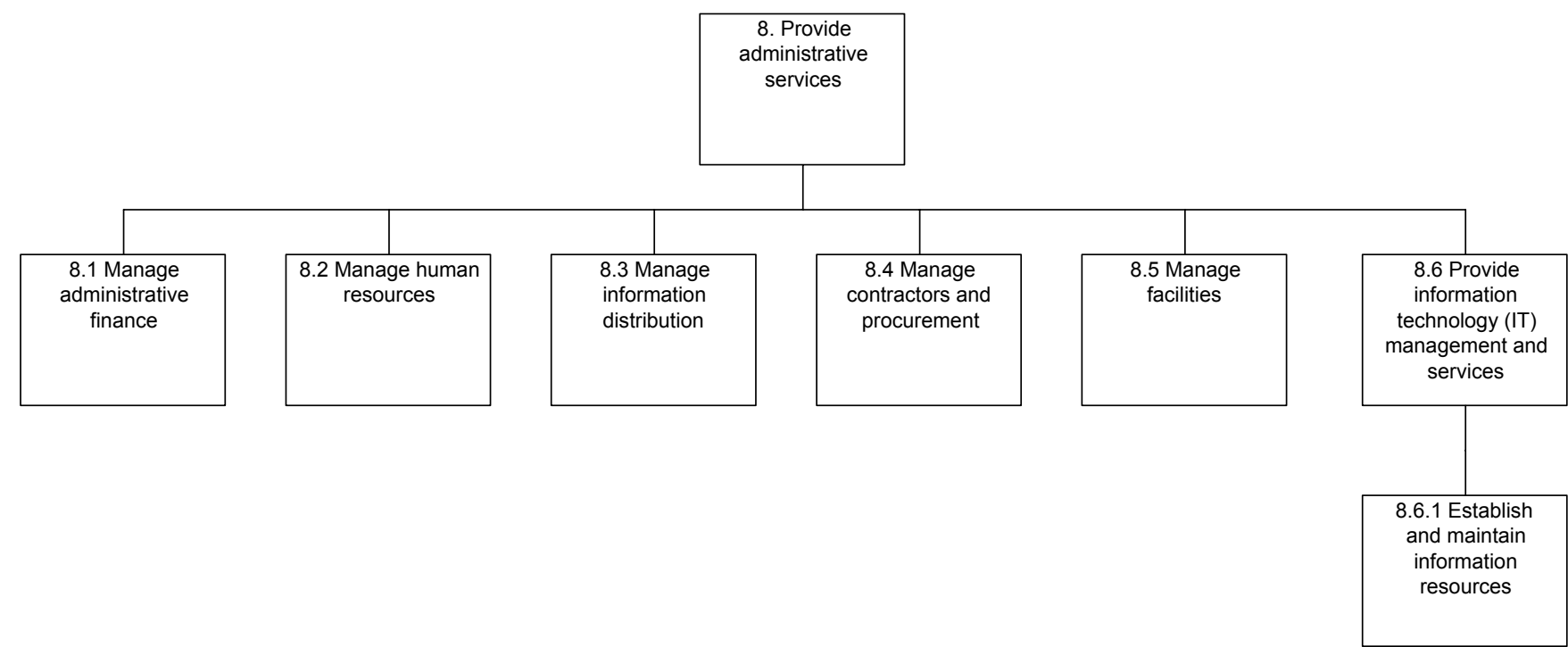
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                        │  8. Provide     │
                        │  administrative │
                        │  services       │
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│8.1     │ │8.2     │ │8.3     │ │8.4     │ │8.5     │ │8.6 Provide  │
│Manage  │ │Manage  │ │Manage  │ │Manage  │ │Manage  │ │information   │
│admini- │ │human   │ │infor-  │ │contrac-│ │faci-   │ │technology    │
│strative│ │resources│ │mation │ │tors and│ │lities  │ │(IT)         │
│finance │ │        │ │distri- │ │procure-│ │        │ │management   │
│        │ │        │ │bution  │ │ment    │ │        │ │and services │
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                                                         │8.6.1       │
                                                         │Establish   │
                                                         │and maintain│
                                                         │information │
                                                         │resources   │
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8. Provide administrative services—functions necessary to provide common services in support of CMS's mission.

8.1 Manage administrative finance—provide budget and accounting administrative services for CMS's financial management program. This includes paying contractor and vendor invoices and travel advances and reimbursements to employees.

8.2 Manage human resources—classify, train, hire, and retire employees. This function includes administering employee benefits, employee incentive programs, labor relations, and Equal Opportunity Programs (EEO) programs.

8.3 Manage information distribution—provide publication and disbursement services for documents in both printed and electronic media. This includes the development of graphics and library services.

8.4 Manage contractors and procurement—acquire products and services in accordance with applicable laws, regulations, and policies. This process does not include contracts that are legislatively mandated, such as carrier, intermediary, DMERC, and MCO contracts.

8.5 Manage facilities—manage physical facilities and deliver facility-related administrative services.

8.6 Provide information technology (IT) management and services—provide IT support required by CMS in the performance of its mission and objectives. This includes the management of information, data, applications, infrastructure, IT standards, and IT security.

8.6.1 Establish and maintain information resources—compile and maintain information relating to particular subject areas that result in the construction of databases, data marts, or data warehouses.

9. Manage Outreach and Education

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                              │  9. Manage   │
                              │ outreach and │
                              │  education   │
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 │9.1 Perform  ││9.2 Determine││9.3 Provide││9.4 Manage ││9.5 Manage   │
 │policy change││health       ││public/    ││beneficiary││customer     │
 │impact       ││care         ││beneficiary││communi-   ││outreach     │
 │analysis     ││requirements ││awareness  ││cation     ││             │
 │             ││             ││and        ││           ││             │
 │             ││             ││assistance ││           ││             │
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 │9.1.1 Provide│              │9.3.1      ││9.4.1      ││9.5.1 Educate │
 │policy       │              │Provide    ││Investigate││interested    │
 │clarifications              │awareness  ││beneficiary││parties       │
 │to CMS       │              │of national││inquiries  ││regarding PRO │
 │partners     │              │clinical   ││and        ││activities    │
 │             │              │topics     ││complaints ││              │
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                                          │9.4.2 Reply  │
                                          │to           │
                                          │beneficiary  │
                                          │inquiries    │
                                          │and          │
                                          │complaints   │
                                          └─────────────┘
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9. Manage outreach and education—functions necessary for communication with program beneficiaries, recipients, providers, and partners.

9.1 Perform policy change impact analysis—analyze the impact of proposed CMS policies, regulations, and instructions on beneficiaries, recipients, providers, and partners.

9.1.1 Provide policy clarifications to CMS partners—identify a need for policy clarification and provide the clarification to involved partners (e.g., Medicare contractors, PROs, States).

9.2 Determine health care requirements—determine health care requirements through direct contact with the elderly and the needy, and communicate those requirements to CMS components.

9.3 Provide public/beneficiary awareness and assistance—seek out and provide information to potential eligible beneficiaries and recipients through public-awareness campaigns, counseling, assistance, and outreach programs, and encourages participation. This includes developing and refining written materials and other modes of communication with potential beneficiaries and recipients in order to provide useful, accurate, and comprehensive information to enable potential beneficiaries to make informed health care delivery choices.

9.3.1 Provide awareness of national clinical topics—inform Medicare beneficiaries about best health care practices related to selected national clinical topics that will improve the beneficiary's health status.

9.4 Manage beneficiary communication—ensure that correct and prompt responses are made to inquiries and complaints received from beneficiaries. This function ensures that corrective action is taken in response to a problem.

9.4.1 Investigate beneficiary inquiries and complaints—investigate beneficiary complaints received via a hotline, written correspondence, fax, or some other vehicle, within statutory time constraints.

9.4.2 Reply to beneficiary inquiries and complaints—reply to beneficiary complaints received via a hotline, written correspondence, fax, or some other vehicle, within statutory time constraints.

9.5 Manage customer outreach—educate, inform, and survey beneficiaries, organizations representing beneficiaries, recipients, providers and other partners, and other interested parties concerning programs and their administration. This excludes responses to individual information requests and surveys.

9.5.1 Educate interested parties regarding PRO activities—educate the community about PRO activities such as quality improvement projects, national quality improvement statistics, and other PRO-related topics.

10. Manage or Participate in Health Industry Standard Development
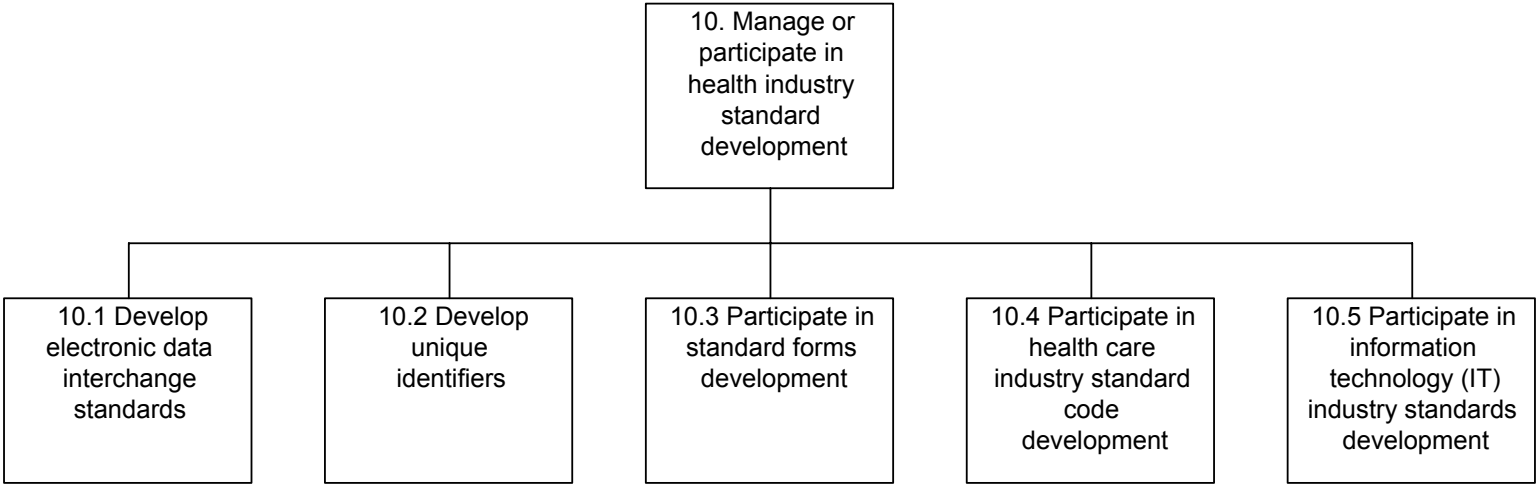
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                    ┌─────────────────┐
                    │ 10. Manage or   │
                    │ participate in  │
                    │ health industry │
                    │ standard        │
                    │ development     │
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        ┌──────────┬─────────┼─────────┬──────────┐
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│10.1 Develop  ││10.2      ││10.3      ││10.4      ││10.5      │
│electronic    ││Develop   ││Participate││Participate││Participate│
│data          ││unique    ││in standard││in health ││in        │
│interchange   ││identifiers││forms     ││care      ││information│
│standards     ││          ││development││industry  ││technology│
│              ││          ││          ││standard  ││(IT)      │
│              ││          ││          ││code      ││industry  │
│              ││          ││          ││development││standards │
│              ││          ││          ││          ││development│
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10. Manage or participate in health industry standard development—functions necessary to work with industry in developing industry-wide standards to ensure that the health care needs of Americans are appropriately considered.

10.1 Develop electronic data interchange standards—develop and maintain electronic data interchange health care transaction standards with the industry.

10.2 Develop unique identifiers—develop and maintain industry-wide unique identifiers for beneficiaries, providers, health care payers (e.g., PAYERID), and other entities relative to health care.

10.3 Participate in standard forms development—develop and maintain standard forms and formats in collaboration with the health care industry.

10.4 Participate in health care industry standard code development—work with the health care industry in developing diagnosis and medical procedure codes, as well as other codes affecting payment.

10.5 Participate in information technology (IT) industry standards development—work with the IT industry in developing standards (e.g., IT development tools and commercial or government off-the-shelf software products) to ensure that the needs of CMS's beneficiaries are met.

11. Manage Program Quality
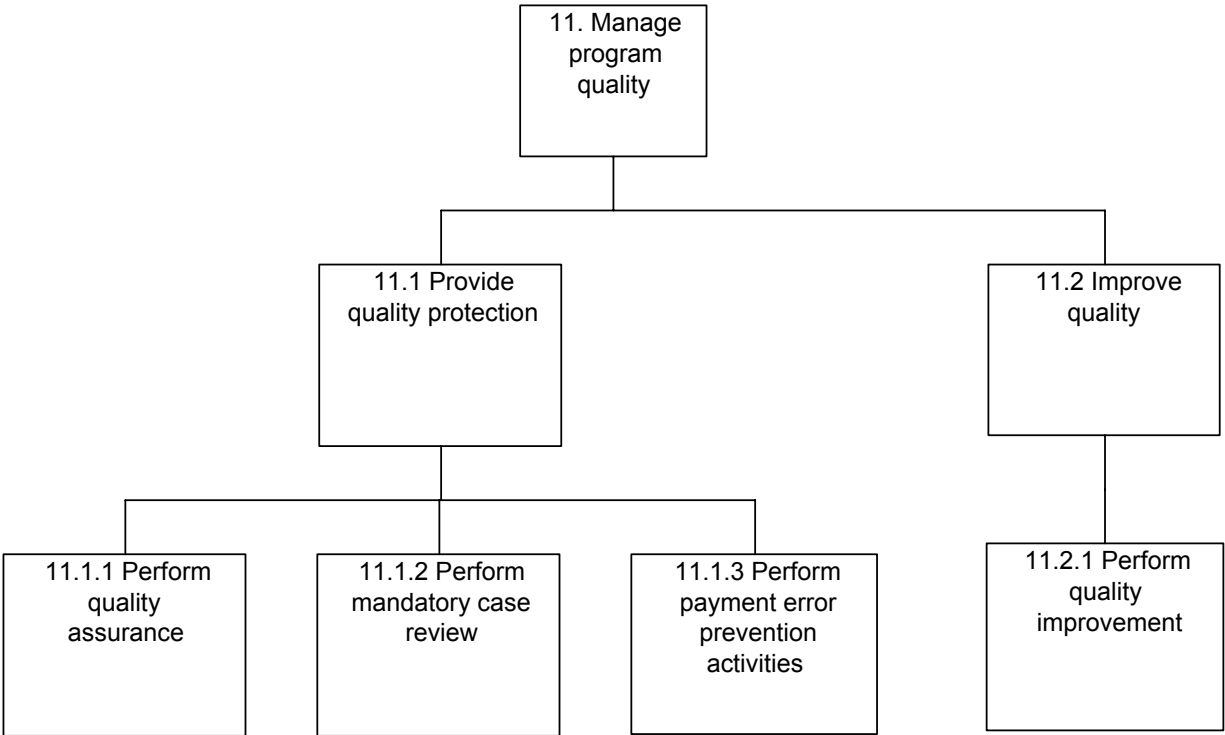
11. Manage program quality—functions necessary to monitor and improve the quality of health care provided to and the health status of beneficiaries participating in CMS-administered programs.

11.1 Provide quality protection—identify, investigate complaints about, disallow for payment, and/or correct health care that falls below standards. This includes processes performed by PROs, State agencies (survey and certification), and ESRD networks.

11.1.1 Perform quality assurance—ensure that high-quality care is provided to beneficiaries by MCOs and all health care providers. This includes identifying and investigating complaints, processing grievances against MCOs and other providers, and performing other quality assurance activities.

11.1.2 Perform mandatory case review—review beneficiary cases involving complaints, referrals, assistance at cataract surgery, critical access hospitals, sanctions, higher-weighted DRGs, non-coverage notices, and medical necessity.

11.1.3 Perform payment error prevention activities—reduce payment error rates. This includes analyzing State data, targeting providers with high error rates, and educating providers on ways to improve service.

11.2 Improve quality—ensure that health care rendered by CMS-administered programs reflects current clinical and scientific knowledge. This includes processes performed by PROs, State agencies (survey and certification), MCOs, and ESRD networks.

11.2.1 Perform quality improvement—conduct both national and local quality improvement projects.

ORGANIZATIONAL STRUCTURE

Figure 3-2 presents a chart of CMS's parent or highest-level organization.

Figure 3-2. CMS Organizational Chart
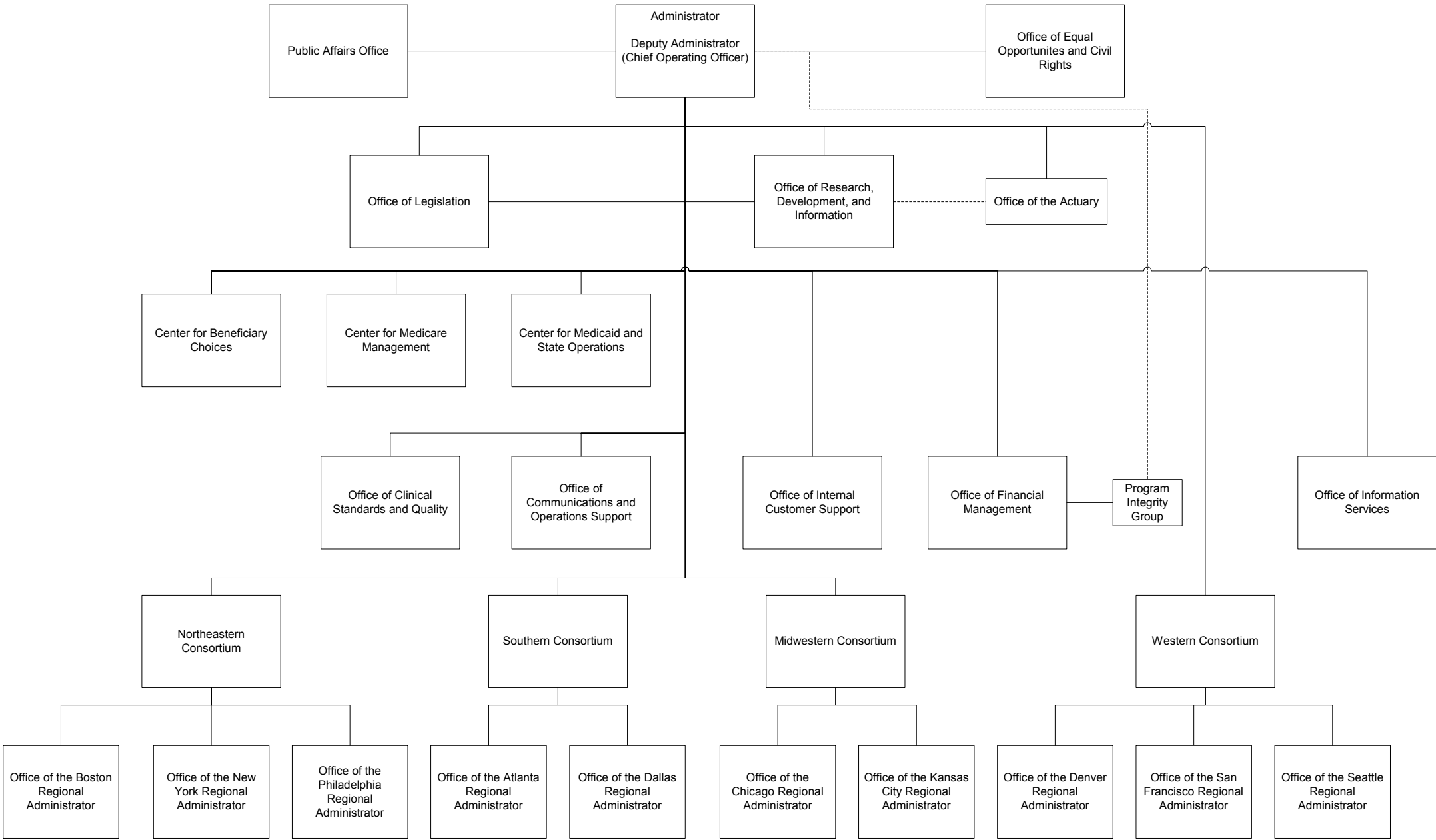
Note: Approved structure as of November 1, 2001.

The following is a list of CMS organizational units broken down to the group level:

Center for Beneficiary Choices (accurate as of 11/1/01)

    Privacy Rights and Protection Staff

    Business Operations Staff

    Communications Staff

    Partnership and Promotion Group

    Beneficiary Information Services Group

    Beneficiary Education and Analysis Group

    Health Plan Policy Group

    Demonstration and Data Analysis Group

    Quality Measurement and Health Assessment Group

Center for Medicaid and State Operations (accurate as of 11/5/01)

    Policy Coordination and Planning Group

    Private Health Insurance Group

    Family and Children's Health Program Group

    Disabled and Elderly Health Program Group

    Survey and Certification Group

    Finance, Systems, and Quality Group

Center for Medicare Management (accurate as of 11/5/01)

    Northeastern Consortium Contractor Management Staff

    Southern Consortium Contractor Management Staff

    Midwestern Consortium Contractor Management Staff

    Western Consortium Contractor Management Staff

    Executive Secretariat

    Impact and Analysis Staff

    Program Support Staff

    Professional Relations Staff

    Purchasing Policy Group

    Chronic Care Policy Group

    Provider Billing and Education Group

    Medicare Contractor Integrity and Performance Group

    Medicare Contractor Management Group

    Benefits Operations Group

Chief of Operations

Office of Clinical Standards and Quality (accurate as of 11/1/01)

    Clinical Standards Group

    Coverage and Analysis Group

    Information System Group

    Quality Improvement Group

Office of Communications and Operations Support (accurate as of 7/2/01)

    Office of the Attorney Advisor

    Executive Council and Special Initiatives Group

    Operations Support Group

    Program Coordination Group

Office of Equal Opportunity and Civil Rights

Office of Financial Management (accurate as of 11/1/01)

    HIGLAS Program Office

    Budget and Analysis Group

    Financial Services Group

    Program Integrity Group

Accounting and Risk Management Group

Office of Information Services (accurate as of 11/1/01)

HIGLAS Program Office

Information Technology Architecture Staff

Security and Standards Group

Investment Planning and Management Group

Systems Quality Group

Business Systems Operations Group

Enterprise Databases Group

Technology Management Group

Office of Internal Customer Support (accurate as of 11/1/01)

Acquisition and Grants Group

Administrative Programs Systems Staff

Administrative Services Group

Human Resources Management Group

Learning Resources Group

Office of Hearings

Office of Legislation (accurate as of 9/4/01)

Congressional Affairs Group

Hearings and Policy Presentation Group

Medicaid Analysis Group

Medicare Part A Analysis Group

Medicare Part B Analysis Group

Office of Research, Development, and Information (accurate as of 1/4/02)

Information and Methods Group

Planning and Policy Analysis Group

Research and Evaluation Group

Systems Technical and Analytic Resources Group

Office of the Actuary (accurate as of 7/2/01)

Medicare and Medicaid Cost Estimates Group

National Health Statistics Group

Office of the Administrator

Program Integrity Group

Public Affairs Office

CMS ENTERPRISE GROUPINGS

Figure 3-3 depicts the external entities that interact with CMS while carrying out its mission-related functions. Several external entities also act as agents of CMS by performing functions on its behalf.

Figure 3-3. CMS Context Diagram
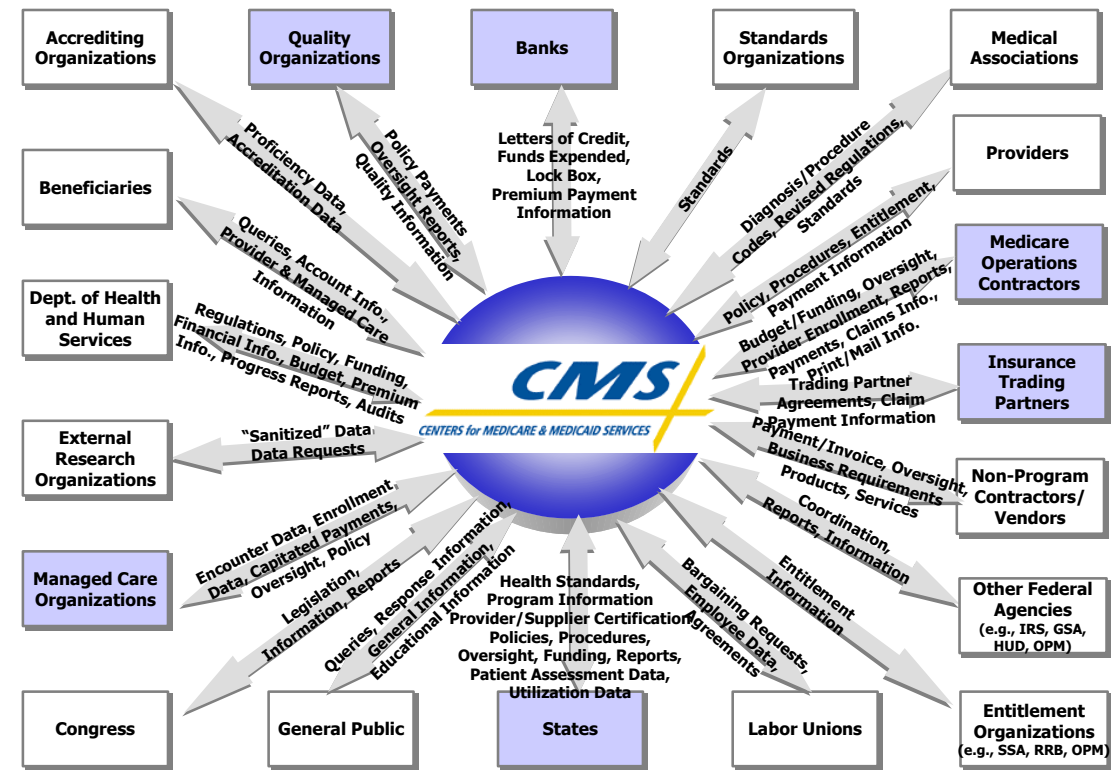
Note: Shaded external entities are those that perform functions for CMS to support our mission and that are under CMS control for performing these functions. Those external entities that are not shaded merely exchange information with CMS, but do not perform mission-related functions.

Table 3-2 is a categorization of CMS components and external entities grouped logically. These components and agents perform needed enterprise functions for CMS.

Table 3-2. CMS Enterprise Groupings

CMS components	Medicare operations contractors	Banks	Quality organizations	Managed care organizations	States
Central office	Claims processing contractor	Medicare Premium Collection Center	Peer review organization	Managed Care Organization	Medicaid State Agency
Regional offices/consortia	Customer service contractor	Claims processing contractor accountant	ESRD Network		State Survey and Certification Agency
	Medicare integrity program contractor	Clinical laboratory program financier			
	Print/mail contractor	Managed Care Organizations loans financier			
	Medical savings account contractor				

ORGANIZATIONAL OWNERS

Table 3-3 shows which CMS organizational components support which business functional areas and functions. Table 3-4 shows which external entities support which business functional areas and functions. The cells of the tables contain the letters M and S. *M* indicates *major* involvement in a particular functional area or function by an organizational entity, while *S* indicates *some* involvement. The letters were derived mathematically through the following method:

◆ The number of full-time employees (FTEs) was rounded to the nearest whole number.

◆ If the number of FTEs for a CMS component involved in a particular functional area or function was greater than or equal to the average number of FTEs per component for the entire organization performing that function, then *M* was assigned.

◆ If the number of FTEs for a CMS component involved in a particular functional area or function was less than the average number of FTEs per component for the entire organization performing that function, *S* was assigned.

◆ Because the number of FTEs was rounded to the nearest whole number, an organization with a value less than 0.5 FTEs was considered as having no involvement, so no letter was assigned.

By examining these tables, the reader can identify areas where duplication of effort may exist.

Table 3-3. CMS Organizational Entities Supporting Business Functional Areas and Functions

Organizational components	1. Manage CMS administrative processes	1.1 Manage strategic planning	1.2 Provide organizational management	1.3 Assess programs	1.3.1 Evaluate effectiveness of CMS programs	1.3.2 Develop and implement a management improvement strategy	1.3.3 Develop a CMS surveillance strategy	1.4 Manage investments	2. Develop programs	2.1 Manage partner relationship policy development	2.1.1 Develop policies for contracts, grants, and agreements	2.2 Provide actuarial services	2.3 Manage Medicare beneficiary enrollment policy development	2.3.1 Develop Medicare Beneficiary Enrollment in Managed Care Organization (MCO)	2.3.2 Develop MCO payment policy	2.4 Manage Medicaid/SCHIP beneficiary eligibility policy development	2.5 Manage payment policy development	2.6 Manage coverage policy development	2.7 Manage program data and statistics	2.7.1 Identify quality of care indicators for the PRO program	2.8 Manage research and evaluation	2.9 Manage demonstration projects	2.9.1 Perform PRO special study activities	2.10 Manage legislation activities and regulation development	2.11 Manage Medicare claims appeals grievances and complaints policy development	2.12 Manage quality of care/utilization review policy development	2.12.1 Develop policies for mandatory case review performed by Peer Review Organizations (PRO)	2.12.2 Develop policy for beneficiary rights outreach and educational activities	2.13 Manage program integrity policy development	2.13.1 Coordinate Medicare Managed Care Organization program integrity policy	2.13.2 Guide Medicaid/SCHIP program integrity policy for states	2.14 Manage policy development for participation of providers
Center for Beneficiary Choices	M	M	M	M				S	M	M			M			S	M	S	M		M	M		M		M			S			S
Center for Medicaid and State Operations	M	M	M	M				M	M	M			M			M	M	M	M		S			M		M			M			M
Center for Medicare Management	S	S	S	S				S	M	S		S	S			S	M	M	M		M					M	S	M				M
Office of the Actuary	S		S						M			M									M	M		S		M						
Office of the Administrator	M		M	S					S	S																						
Office of Clinical Standards and Quality	M	S	S	S				M	M	S											M	M		S		M		M				M
Office of Communications And Operations Support	S	S	S	S					M	S			M			M	M	M			S			M	M	M			M			S
Office of Equal Opportunity and Civil Rights	S		S	S					S					S		S		S										S				
Office of Financial Management	M	S	S	M				M																								
Office of Information Services	M	M	S	M				M																								
Office of Internal Customer Support	M	S	M	M				M	S	S													S									
Office of Legislation	S	S	S	S					M	M	S						S							M	S	S			S			S
Office of Research, Development, and Information	S	S	S	S				S	M		S						S	S	M		M	M		S		S						
Office of the Atlanta Regional Administrator	M	M	S	M					M	M			M			M	S	M	M		M	M		S	M	S			M			M
Office of the Boston Regional Administrator	M	M	M	M				S	M	M			S			S	S	S	S		S	S		S	S	S			M			S
Office of the Chicago Regional Administrator	M	S	M	M				M	M							S	S	S	S		S	S		S	S	M						M
Office of the Dallas Regional Administrator	M	M	M	M				S	M	M						M		S	S		S	M		S	S	S						M
Office of the Denver Regional Administrator	M	M	M	S					M	S					S	M	S	M	S		S	S			S	M			S			S
Office of the Kansas City Regional Administrator	M	M	M	M				S	M	S						S	S	S	S							M						M
Office of the New York Regional Administrator	M	M	M	M					M	S					M	S	S	S	S			S				M	M		M			S
Office of the Philadelphia Regional Administrator	M	S	M	S				S	M							M	S	S	S							S			S			M
Office of the San Francisco Regional Administrator	M	M	M	M				S	M	M					M	S	S	M	S			S		S	S	S						S
Office of the Seattle Regional Administrator	M	M	M	M				S	S	S																						
Public Affairs Office	S		S																													

Note: M = Major involvement, S = Some involvement.

The data in this table are from the CMS Workforce Planning Study. The source of the content of this table differs from that of previous versions.

Table 3-3. CMS Organizational Entities Supporting Business Functional Areas and Functions (Continued)

Organizational components	3. Manage program operations	3.1 Maintain Medicare beneficiary enrollment	3.1.1 Enroll beneficiaries in MCOs and demonstrations	3.1.2 Disenroll beneficiaries in MCOs and demonstrations	3.2 Manage Medicaid and SCHIP entitlement/eligibility and maintenance	3.3 Manage provider enrollment	3.4 Determine managed care organizations eligibility	3.4.1 Process managed care organization applications	3.4.2 Review Adjusted Community Rating (ACR) proposals	3.4.3 Qualify and administer managed care organization contracts	3.5 Manage Medicare contractors	3.5.1 Evaluate contractor performance	3.6 Manage peer review and ESRD network contractors	3.6.1 Award and maintain contracts with PROs	3.6.2 Monitor and evaluate PRO performance	3.6.3 Serve as technical advisor to support PROs	3.6.4 Monitor mandatory case review activities performed by PROs	3.6.5 Monitor PRO activities relative to beneficiary rights outreach and	3.6.6 Monitor PRO activities relative to the payment error prevention program	3.7 Process Medicare claims	3.8 Manage claims pricing	3.9 Oversee State health insurance	3.10 Coordinate benefits	3.11 Process Medicare appeals, grievances, and complaints	3.11.1 Process appeals of managed care organization claims	3.11.2 Hear provider protests	4. Manage Medicare finances	4.1 Monitor contractor administrative budget and costs	4.1.1 Fund PRO program and special studies	4.1.2 Prepare and maintain the PRO procurement plan	4.1.3 Request apportionment for the PRO program	4.2 Manage premium collection	4.3 Manage benefit payment accounting
Center for Beneficiary Choices	M	S				S	S				S										M						M					S	S
Center for Medicaid and State Operations	M	S			M		S				S										S	M	M				M	M					
Center for Medicare Management	M										M									M	M			M			M	M					S
Office of the Actuary	S										S																						
Office of the Administrator																																	
Office of Clinical Standards and Quality	M										S		M							S				S			S	S					
Office of Communications And Operations Support	M	S			S						S		S							M							S						
Office of Equal Opportunity and Civil Rights	S																					S											
Office of Financial Management	M					M	S				S									S				S			M	M				M	M
Office of Information Services	M	M			M	S	M				M									S				M			M	S				M	S
Office of Internal Customer Support	M	S									M		S									S	M	M			S	S					S
Office of Legislation	M					M																											
Office of Research, Development, and Information	S																				S						S	S					
Office of the Atlanta Regional Administrator	M	M			M	S	M				M									M			M	M			M	M					M
Office of the Boston Regional Administrator	M	M			S	M	S				M		M							M	S	M	M	M			M	M					M
Office of the Chicago Regional Administrator	M				M	S	S				M									S	S	M		M			M	M					M
Office of the Dallas Regional Administrator	M	M			M	M					M		M							S	S	S		M			M	M					M
Office of the Denver Regional Administrator	M	M			M	M	M				M									M		M		S			M	M					S
Office of the Kansas City Regional Administrator	M	M			M	S	M				M		M							S		M		S			M	M					
Office of the New York Regional Administrator	M	M			M	M	M				M		S								M	S	M	M			M	M					
Office of the Philadelphia Regional Administrator	M	S			M	S	M				M									M	S	M	M	S			M	M					S
Office of the San Francisco Regional Administrator	M	M			M	S	S				M		S							S	S	M		S			M	M					M
Office of the Seattle Regional Administrator	M	M				M	M				M		M							M	M	S	M	M			M	M					M
Public Affairs Office																																	

Note: M = Major involvement, S = Some involvement.

The data in this table are from the CMS Workforce Planning Study. The source of the content of this table differs from that of previous versions.

Table 3-3. CMS Organizational Entities Supporting Business Functional Areas and Functions (Continued)

Organizational components	4.4 Manage Medicare contractor banking	4.5 Manage provider financial management	4.6 Manage provider cost reports	4.7 Manage MCO payment and fee collection	4.7.1 Pay MCOs	4.7.2 Calculate Medicare beneficiary risk adjusters for MCOs	4.8 Manage debt collection accounting	5. Manage program integrity operations	5.1 Review post payment	5.2 Monitor utilization	5.3 Conduct medical review	5.4 Manage fraud, waste, and abuse	5.5 Manage Medicare secondary payer review	5.6 Monitor compliance	5.6.1 Monitor MCO compliance	6. Administer Medicaid and SCHIP	6.1 Manage State plan approval	6.2 Maintain Medicaid and SCHIP budgets	6.3 Evaluate State performance	6.4 Fund State Medicaid and SCHIP	6.5 Manage State Medicaid program and SCHIP initiatives	6.6 Provide Medicaid drug rebate management	6.7 Manage system certification	7. Manage CMS relationships	7.1 Manage congressional relations	7.2 Manage media relations	7.3 Manage intergovernmental relations	7.4 Manage health care industry relations	7.5 Manage beneficiary representative organization relations	7.6 Manage employer group relations	7.7 Manage State relations	8. Provide administrative services	8.1 Manage administrative finance	8.2 Manage human resources
Center for Beneficiary Choices			M				S	M	M	M						M	M	M	M	M	M			M	S	S	M	S	M	M	S	S	S	S
Center for Medicaid and State Operations		S						M				M		S		M	M	M	S	M	M	M		M	M	M	M	M	M	S	M	M	M	S
Center for Medicare Management		S	M				S	S				S	S											M	M	S	M	M	S	M	S	M	S	S
Office of the Actuary																								S			S					S	S	S
Office of the Administrator																								S			S		S		S	S	S	S
Office of Clinical Standards and Quality								M	M															M	S	S	S	M	S			M	S	S
Office of Communications And Operations Support		S					S	M				S		M		S					S	S		M	M	M	M	M	M			S	S	S
Office of Equal Opportunity and Civil Rights																								S			S					M	S	M
Office of Financial Management	M	M	M	M			M	M	M	M	M	M	M	M		M		M		M	M			M	M		M	S		M		M	M	S
Office of Information Services		S	M	M				S				S				M							M	M	S	M	M	S	S		S	M	S	S
Office of Internal Customer Support								M	M			S				S					S			M	S	S	M	S	S		S	M	S	M
Office of Legislation																S					S	S		M	M	S	S					S	S	S
Office of Research, Development, and Information								M	S	M						S					S			S	S	S	S	S	S			M	S	S
Office of the Atlanta Regional Administrator	M	M	M	S			M	M	M	M	M	M	M	M		M	M	M	M	M	M		M	M	M	M	M	M	M	M	S	M	M	M
Office of the Boston Regional Administrator		M	S				S	M	M	M	M	S	M	M		M	M	M	M	M	M	M	M	M	M	S	M	M	M	M	M	M	M	S
Office of the Chicago Regional Administrator	M	M	M				M	M	M	M	M	M	M	M		M	M	M	M	M	S		M	M	M	S	M	S	S		M	M	M	M
Office of the Dallas Regional Administrator		M	M				M	M	M	M	M	M	M	S		M	M	M	M	M	S		M	M	M	S	S	S	S		M	M	M	S
Office of the Denver Regional Administrator		S	S				S	M			S	M	M	M		M	M	M	M	M	M	M	S	M	S	S	S	S	M	M	M	S	S	S
Office of the Kansas City Regional Administrator	M	M	M				M	M				M	S		S	M	M	M	M	S	M		M	M	S	S	M	S	M	M	M	M	M	S
Office of the New York Regional Administrator		M	M				M	M		S	M	M	M	M		M	M	M	M	M	M		M	M	M	S	M	S	M	M	M	M	M	S
Office of the Philadelphia Regional Administrator	M	M	S					M	S	M		M	M	M		M	M	M	M	M	M		M	M	S	S	S	S	S		M	M	M	S
Office of the San Francisco Regional Administrator		M	M				M	M	S		S	M	M	M		M	M	M	M	M	S	M		M	S	S	S	S	M		M	S	S	S
Office of the Seattle Regional Administrator		M	S				M	M	M	M	S	S	M	S		M	M	M	M	S	M	S	S	M	S	M	S	S	S	S	S	S	S	S
Public Affairs Office								S				S				S							S	M		M						S	S	

Note: M = Major involvement, S = Some involvement.
The data in this table are from the CMS Workforce Planning Study. The source of the content of this table differs from that of previous versions.

Table 3-3. CMS Organizational Entities Supporting Business Functional Areas and Functions (Continued)

Organizational components	8.3 Manage information distribution	8.4 Manage contractors and procurement	8.5 Manage facilities	8.6 Provide information technology (IT) management and services	8.6.1 Establish and maintain information resources	9. Manage outreach and education	9.1 Perform policy change impact analysis	9.1.1 Provide policy clarifications to CMS partners	9.2 Determine health care requirements	9.3 Provide public/beneficiary awareness and assistance	9.3.1 Provide awareness of national clinical topics	9.4 Manage beneficiary communication	9.4.1 Investigate beneficiary inquiries and complaints	9.4.2 Reply to beneficiary inquiries and complaints	9.5 Manage customer outreach	9.5.1 Educate interested parties regarding PRO activities	10. Manage or participate in health industry standards development	10.1 Develop electronic data interchange standards	10.2 Develop unique identifiers	10.3 Participate in standard forms development	10.4 Participate in health care industry standard code development	10.5 Participate in information technology (IT) industry standards development	11. Manage program quality	11.1 Provide quality protection	11.1.1 Perform quality assurance	11.1.2 Perform mandatory case review	11.1.3 Perform payment error prevention activities	11.2 Improve quality	11.2.1 Perform quality improvement
Center for Beneficiary Choices	S	S	S	S		M	S		M	M		S			M		M	M	M	M		S	M	M				S	
Center for Medicaid and State Operations	S	S	S	S		M	M		M	M		S			M		M	S		M	S	S	M	M				M	
Center for Medicare Management	M	S	S	S		M	S			S		S			M		M		M		M								
Office of the Actuary		S				S	S					S			S														
Office of the Administrator																													
Office of Clinical Standards and Quality	M	S	S	M		M	M								S		M	M		M		M	M	S				M	
Office of Communications And Operations Support	S	S		S		M	M			S		S					M	M	M	M	M		S	S				S	
Office of Equal Opportunity and Civil Rights		S				S									S														
Office of Financial Management	S	S	S	M		S	S			S		S					S					S	S	S				S	
Office of Information Services	M	M		M		M	M		S	S		S			M		M	M	M	M	M	M	S					S	
Office of Internal Customer Support	M	M	M	M		M	S			M					M		M			M			S					S	
Office of Legislation	S		S			S	S			S					S														
Office of Research, Development, and Information	M	M	S	S		M	S			S		M			S								S					S	
Office of the Atlanta Regional Administrator	S	S	S	S		M	M		S	M		M			M		M			M	M		M	M				M	
Office of the Boston Regional Administrator	M	S	S	S		M	M		S	M		M			M		M	M		M		S	M	M				M	
Office of the Chicago Regional Administrator	S	S	M	M		M	M		M	M		M			M		S	S					M	M				M	
Office of the Dallas Regional Administrator	S	S	S	S		M	S		S	S		M			M		M				M		M	M				M	
Office of the Denver Regional Administrator	S	S	S	S		M	M		M	S		S			S		S				S		M	M				M	
Office of the Kansas City Regional Administrator	S	S	M	S		M	M		S	M		M			M		S	S					M	M				M	
Office of the New York Regional Administrator	M	S	M	S		M	S		M	M		M			M		S	S					M	M				S	
Office of the Philadelphia Regional Administrator	M	S	S	S		M	M			M		M			M		S	S					M	M				S	
Office of the San Francisco Regional Administrator	S	S	S	S		M	M		M	M		M			M		M	M	M	M	M	M	M	M				S	
Office of the Seattle Regional Administrator	S	S	S			M	M			M		M			M								M	M				S	
Public Affairs Office	S		S	S		S				S		S			S														

Note: M = Major involvement, S = Some involvement.
The data in this table are from the CMS Workforce Planning Study. The source of the content of this table differs from that of previous versions.

Table 3-4. External Entities Supporting Business Functional Areas and Functions

External entities	1. Manage CMS administrative processes	1.1 Manage strategic planning	1.2 Provide organizational management	1.3 Assess programs	1.3.1 Evaluate effectiveness of CMS programs	1.3.2 Develop and implement a management improvement strategy	1.3.3 Develop a CMS surveillance strategy	1.4 Manage investments	2. Develop programs	2.1 Manage partner relationship policy development	2.1.1 Develop policies for contracts, grants, and agreements	2.2 Provide actuarial services	2.3 Manage Medicare beneficiary enrollment policy development	2.3.1 Develop policy for Medicare beneficiary enrollment in Managed Care	2.3.2 Develop MCO payment policy	2.4 Manage Medicaid/SCHIP beneficiary eligibility policy development	2.5 Manage payment policy development	2.6 Manage coverage policy development	2.7 Manage program data and statistics	2.7.1 Identify quality of care indicators for the PRO program	2.8 Manage research and evaluation	2.9 Manage demonstration projects	2.9.1 Perform PRO special study activities	2.10 Manage legislative activities and regulation development	2.11 Manage Medicare claims appeals, grievances and complaints policy development	2.12 Manage quality of care/utilization review policy development	2.12.1 Develop policies for mandatory case review performed by Peer	2.12.2 Develop policy for beneficiary rights outreach and educational	2.13 Manage program integrity policy development	2.13.1 Coordinate Medicare Managed Care Organization program integrity policy	2.13.2 Guide Medicaid/SCHIP program integrity policy for States	2.14 Manage policy development for participation of providers	3. Manage program operations	3.1 Maintain Medicare beneficiary enrollment
Banks																																		
Claims processing contractor accountant																																		
Clinical laboratory program financier																																		
Managed Care Organization loans financier																																		
Medicare Premium Collection Center																																		
Managed Care Organizations																																		
Managed Care Organization									M																				M				M	M
Medicare Operations Contractors																																		
Claims processing contractor									S								S	S															M	
Customer service contractor																																	S	
Medical savings account contractor																																		
Medicare Integrity Program contractor																																		
Print/mail contractor																																		
Quality organizations																																		
ESRD network									M														S			M							M	
Peer review organization									M														S			M							M	
States																																		
Medicaid State Agency									M							S													M					
State Survey and Certification Agency									M							S													M					

Note: M = Major involvement, S = Some involvement.
The data in this table are from the HCFA ITA, Version 2.0. Volume 2.

Table 3-4. External Entities Supporting Business Functional Areas and Functions (Continued)

External entities	3.1.1 Enroll beneficiaries in MCOs and demonstrations	3.1.2 Disenroll beneficiaries in MCOs and demonstrations	3.2 Manage Medicaid and SCHIP entitlement/eligibility and maintenance	3.3 Manage provider enrollment	3.4 Determine managed care organizations eligibility	3.4.1 Process managed care organization applications	3.4.2 Review Adjusted Community Rating (ACR) proposals	3.4.3 Qualify and administer managed care organization contracts	3.5 Manage Medicare contractors	3.5.1 Evaluate contractor performance	3.6 Manage peer review and ESRD network contractors	3.6.1 Award and maintain contracts with PROs	3.6.2 Monitor and evaluate PRO performance	3.6.3 Serve as technical advisor to support PROs	3.6.4 Monitor mandatory case review activities performed by PROs	3.6.5 Monitor PRO activities relative to beneficiary rights outreach and	3.6.6 Monitor activities relative to the payment error prevention program	3.7 Process Medicare claims	3.8 Manage claims pricing	3.9 Oversee State health insurance	3.10 Coordinate benefits	3.11 Process Medicare appeals, grievances, and complaints	3.11.1 Process appeals of managed care organization claims	3.11.2 Hear provider protests	4. Manage Medicare finances	4.1 Monitor contractor administrative budget and costs	4.1.1 Fund PRO program and special studies	4.1.2 Prepare and maintain the PRO procurement plan	4.1.3 Request apportionment for the PRO program	4.2 Manage premium collection	4.3 Manage benefit payment accounting	4.4 Manage Medicare contractor banking	4.5 Manage provider financial management	4.6 Manage provider cost reports
Banks																																		
Claims processing contractor accountant																									M							M		
Clinical laboratory program financier																									M							M		
Managed Care Organization loans financier																									M							M		
Medicare Premium Collection Center																									M					M				
Managed Care Organizations																																		
Managed Care Organization					M																	M			S									
Medicare Operations Contractors																																		
Claims processing contractor				M														M	M		M	M			M	M					M	M	M	M
Customer service contractor																		S																
Medical savings account contractor																									M									
Medicare Integrity Program contractor																									M	M								
Print/mail contractor																									S				S					
Quality organizations																																		
ESRD network																						M			S	S								
Peer review organization																						M			S	S								
States																																		
Medicaid State Agency																									S	S								
State Survey and Certification Agency																									S	S								

Note: M = Major involvement, S = Some involvement.

The data in this table are from the HCFA ITA, Version 2.0. Volume 2.

Table 3-4. External Entities Supporting Business Functional Areas and Functions (Continued)

External entities	4.7 Manage MCO payment and fee collection	4.7.1 Pay MCOs	4.7.2 Calculate Medicare beneficiary risk adjusters for MCOs	4.8 Manage debt collection accounting	5. Manage program integrity operations	5.1 Review post payment	5.2 Monitor utilization	5.3 Conduct medical review	5.4 Manage fraud, waste, and abuse	5.5 Conduct Medicare secondary payer review	5.6 Monitor compliance	5.6.1 Monitor MCO compliance	6. Administer Medicaid and SCHIP	6.1 Manage state plan approval	6.2 Maintain Medicaid and SCHIP budgets	6.3 Evaluate state performance	6.4 Fund State Medicaid and SCHIP	6.5 Manage State Medicaid program and SCHIP initiatives	6.6 Provide Medicaid drug rebate management	6.7 Manage system certification	7. Manage CMS relationships	7.1 Manage congressional relations	7.2 Manage media relations	7.3 Manage intergovernmental relations	7.4 Manage health care industry relations	7.5 Manage beneficiary representative organization relations	7.6 Manage employer group relations	7.7 Manage State relations	8. Provide administrative services	8.1 Manage administrative finance	8.2 Manage human resources	8.3 Manage information distribution	8.4 Manage contractors and procurement	8.5 Manage facilities
Banks																																		
Claims processing contractor accountant																																		
Clinical laboratory program financier																																		
Managed Care Organization loans financier																																		
Medicare Premium Collection Center																																		
Managed Care Organizations																																		
Managed Care Organization	S			S	M					M											S		S		S	S			S					
Medicare Operations Contractors																																		
Claims processing contractor																					S		S		S	S	S		S					
Customer service contractor																																		
Medical savings account contractor	M																																	
Medicare Integrity Program contractor					M	M	M	M																					S					
Print/mail contractor																																		
Quality organizations																																		
ESRD network																					S		S		S	S	S		S					
Peer review organization																					S		S		S	S	S		S					
States																																		
Medicaid State Agency													M	M	S	M	S	S	S	M	M							M	S					
State Survey and Certification Agency													M	M	S	M	S	S	S	M	M							M	S					

Note: M = Major involvement, S = Some involvement.

The data in this table are from the HCFA ITA, Version 2.0. Volume 2.

Table 3-4. External Entities Supporting Business Functional Areas and Functions (Continued)

External entities	8.6 Provide information technology (IT) management and services	8.6.1 Establish and maintain information resources	9. Manage outreach and education	9.1 Perform policy change impact analysis	9.1.1 Provide policy clarifications to CMS partners	9.2 Determine health care requirements	9.3 Provide public/beneficiary awareness and assistance	9.3.1 Provide awareness of national clinical topics	9.4 Manage beneficiary communication	9.4.1 Investigate beneficiary inquiries and complaints	9.4.2 Reply to beneficiary inquiries and complaints	9.5 Manage customer outreach	9.5.1 Educate interested parties regarding PRO activities	10. Manage or participate in health industry standard development	10.1 Develop electronic data interchange standards	10.2 Develop unique identifiers	10.3 Participate in standard forms development	10.4 Participate in health care industry standard code development	10.5 Participate in information technology (IT) industry standards development	11. Manage program quality	11.1 Provide quality protection	11.1.1 Perform quality assurance	11.1.2 Perform mandatory case review	11.1.3 Perform payment error prevention activities	11.2 Improve quality	11.2.1 Perform quality improvement
Banks																										
Claims processing contractor accountant																										
Clinical laboratory program financier																										
Managed Care Organization loans financier																										
Medicare Premium Collection Center																										
Managed Care Organizations																										
Managed Care Organization	S		M	S			M		M			M								M	M				M	
Medicare Operations Contractors																										
Claims processing contractor	S		S	S								S		M	M	S	S	S								
Customer service contractor			S				S																			
Medical savings account contractor																										
Medicare Integrity Program contractor	S		S	S																						
Print/mail contractor																										
Quality organizations																										
ESRD network	S		M				M		M			M								M	M				M	
Peer review organization	S		M				M		M			M								M	M				M	
States																										
Medicaid State Agency	S		M	S			M		M			M		M	M	M	M	M								
State Survey and Certification Agency	S		M	S			M		M			M								M	M				M	

Note: M = Major involvement, S = Some involvement.

The data in this table are from the HCFA ITA, Version 2.0. Volume 2.

Chapter 4
Information Architecture

The Information Architecture identifies the major types of information needed to support the business functions. It identifies and defines the information model, data sets, metadata repositories, and their relationships to the business functions and to application systems.

Many organizations often focus on managing staff, customers, material, and money. With a good understanding of the information and data assets it is managing, an organization also can derive the processes needed to manage those data.

CMS has developed an Information Model Framework that allows the characterization of enterprise information at different level of abstractions. This framework is described in the next section. The following sections present the first three layers of the framework. Finally, as a way to establish linkages of the Information Architecture with other architecture components, the link of subject areas with business functions is presented in a matrix.

INFORMATION MODEL FRAMEWORK

The CMS Information Model Framework is a layered representation of consistently defined data and information models needed to carry out CMS's business functions (see Figure 4–1). Layers within the CMS Information Model Framework progress from a high-level business view and generic representation of business information, to logical data design, through the physical data designs of individual applications. Each layer in the framework corresponds to a view in the Zachman Framework for Enterprise Architecture. The Information Model Framework's triangular shape shows that the amount of detail at the top level is minimal and progressively increases in lower levels. Upper layers are summary in nature and quite generic; therefore, they are very similar for organizations occupying the same industry sectors. The relationship between layers is a rough hierarchy, which supports mapping between adjacent layers.

A *business information classification* layer provides a consolidated view of the business by identifying a small number of business concepts that represent the primary **subject areas** about which CMS must maintain information. These concepts are described in business terminology that is commonly used across the enterprise. This layer also provides the basis for organizing and managing the content of succeeding layers.

An *information model* layer provides a high-level view of the major types of information that are required within the enterprise. It is based on the concept of a Universal Data Model, which is a generic template that models common business patterns (e.g., people

and organizations). The model is customized through incorporation of the business concepts defined in the business information classification layer. This layer supports harmonization of business vocabulary across the agency, providing a common base of basic business terminology; and is being built incrementally with the Enterprise Data Model.

Figure 4–1. Information Model Framework
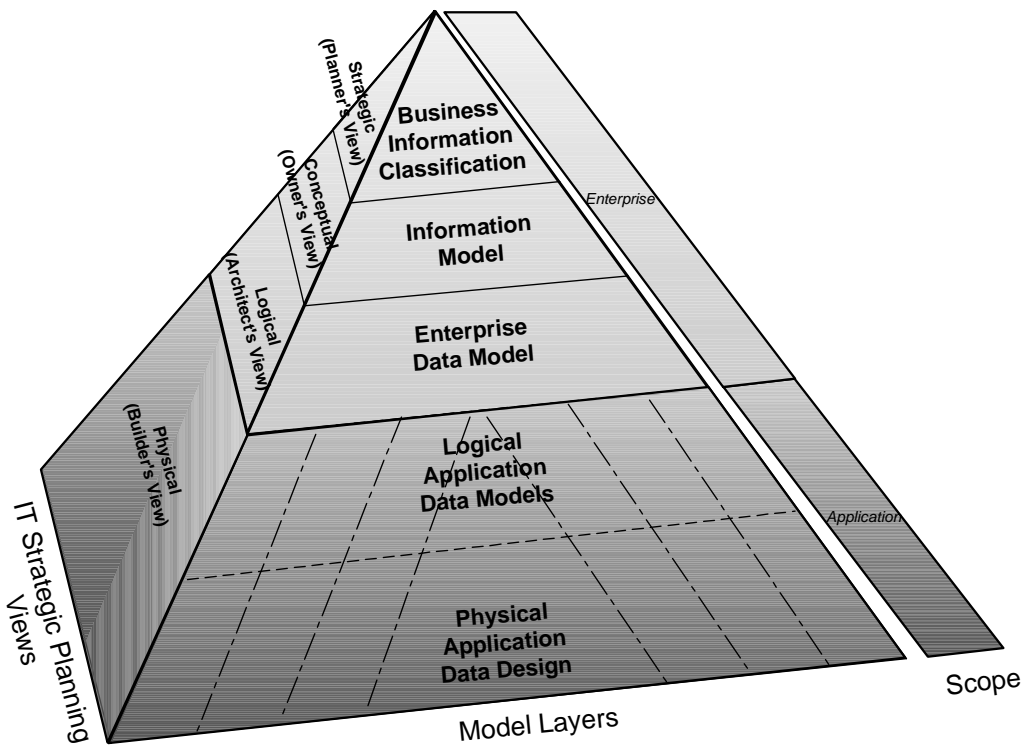
An *enterprise data model* layer provides a logical view of all of the data commonly used throughout the enterprise. CMS's Enterprise Data Model is structured as a traditional entity-relationship diagram, comprising several hundred entities for a large enterprise. It is a logical model that describes the integrated information requirements of the entire organization using general data objects and relationships. It is the primary tool for strategic planning, communicating information requirements throughout the organization, implementing integrated systems, and organizing data in the data warehouse and application data models, described in the *application data model layer*. An enterprise data model conforms to the Third Normal Form requirements of data normalization.

The enterprise data model layer is the pivotal layer of the Information Model Framework, as it connects reusable business concepts to application-level views of enterprise data through generalized content. It is being built incrementally through the logical and physical data design of individual applications.

A *logical application data model* layer provides application-specific models of enterprise data. Application-specific models are closely tied to the enterprise data model. Application data models are built at the logical and physical abstraction levels, and reuse data objects defined at the enterprise level. This ensures that application models will have common keys, attributes, and definitions throughout the enterprise data architecture. A single entity in the enterprise data model can be represented in multiple application-specific models, with attribute variations based on business need (rules), or as subtypes of more generic enterprise entities. Data consistency and reuse are supported through the single entity in the enterprise data model.

A *physical application data design* layer is the lowest layer in the framework, and provides a physical application-specific view of the data. Physical implementation details, such as file system-specific location and physical storage characteristics, are applied in this layer. Locating implementation details in a separate layer insulates the content of upper layers from changes in technology.

The top three layers of the framework focus on the enterprise, while the lower two are application focused. Through a developmental approach that maps to the enterprise levels, application models remain consistent with enterprise structures, maintaining reusable definitions and sharable data. The Information Architecture focuses on the top three layers of the framework. These layers are discussed in the next two sections.

BUSINESS INFORMATION CLASSIFICATION

The subject areas defined in Table 4-1 classifies CMS's business information. Nineteen subject areas are defined for CMS's information environment. They are based on major business entities derived from the Business Function Model presented in Chapter 3– Business Architecture. Subject areas support a common business vocabulary, help classify the contents of both transactional and analytical data stores, and lend structure to enterprise metadata repositories. A Subject Area Model, depicted in Figure 4–2, places the subject areas in a CMS business context, without introducing more detailed or situation-dependent relationships.

Table 4–1. Definition of Subject Areas

Subject area	Definition
Agreement	Information about formally documented arrangements, including their terms and conditions, that exist between two or more parties.
	Example(s): contracts; grants; inter-agency agreements; data use agreements; coordination of benefit agreements; litigation settlements.
	Exclusion(s): informal or undocumented arrangements.
Assessment	Information about the effectiveness of health care financing, CMS program administration, and industry-wide delivery of health care services. Includes data about population wellness, recorded changes in an individual's wellness that is presumed or known to have been caused by a medical service event (i.e., outcomes), as well as data used to assess that service delivery reflects current clinical and scientific knowledge.
	Example(s): Long-term care resident assessment; population-specific medical record abstracts; Home Health Agency outcome and assessment data; demonstration project evaluations; Medicaid and SCHIP program monitoring/evaluation studies.
	Exclusion(s): CMS employee performance evaluations.
Business_Statement	Information about the function, strategic direction, budget formulation, performance, and plans related to legislated health care programs, assessment of the effectiveness of health care programs, and plans for providing the infrastructure to support CMS's business.
	Example(s): Strategic Plan; Budget and Annual Performance Plan; GPRA requirements; IRM Plan.
	Exclusion(s): administrative policy and regulations; detailed budgetary transactions.
Client	Information about CMS beneficiaries, and special patient populations that may include persons who are not CMS beneficiaries. Special populations include persons who are scheduled to receive, are receiving, or have received health care services—i.e., patients. Such a person may or may not also be a beneficiary.
	Example(s): patient, beneficiary.
	Exclusion(s): other health care stakeholders.
Dispute_&_Resolution	Information resulting from communication between CMS, or one of CMS's agents, and a third party regarding disputes and their resolution. A third party could be a CMS employee, beneficiary, provider, or other business partner. Disputes often involve an appeal or reconsideration of a decision regarding health care service coverage, provision, quality of care, payment, or a non-payment or non-service complaint. A dispute may be resolved in a formal hearing.
	Example(s): appeals, reconsiderations, and grievances; disputes between States and drug manufacturers.
	Exclusion(s): inquiries that are unrelated to a dispute.

Table 4–1. Definition of Subject Areas (Continued)

Subject area	Definition
Document	Information about recorded communication with recognizable structure, on any medium, and intelligible without further processing except for presentation on screen or on the printed page. A document may or may not be a record in the archival or legal sense, subject to the same archival requirements as the Agency's records. Records are recorded evidence of Agency or individual functions, activities and transactions. Represents an inventory of CMS's documents and records. Example(s): trackable correspondence (e.g., inquiries); issuances; publications; press releases; programmatic manuals and forms; Systems of Record; program statistical records; information systems documentation; industry periodicals and publications in the CMS library. Exclusion(s): actual document or record content.
Financial_Statement	Information about budget, grant, payroll, cost accounting, consolidated debt management, fixed asset, component controlled accounting, and general ledger accounting data. It covers all monies allocated through administrative and benefit expenditures and obligations, and all monies received through program administration, operations, and oversight. Example(s): accounts payable and receivable transactions. Exclusion(s): information pertaining to budget formulation activities.
Health_Care_Plan	Information about plan options and health care benefits offered by public and private health insurance payers; includes details on covered services under various benefit packages, as well as premium and service pricing schedules. Example(s): Medicare Part A & B; Medicare +Choice; Medigap plans; self-insured employer group plans; Medicaid and SCHIP coverage plans; and other public health coverage plans—e.g., CHAMPUS, Indian Health. Exclusion(s): individual beneficiary plan enrollment and premium payments; insurer characteristics.
Human_Resource	Information about Agency personnel including, but not limited to, position histories, performance plans, attendance records, travel/training and skills profile. This is the master list of CMS employees. Example(s): SF171; SF50; completed standard benefit and personnel forms. Exclusion(s): payroll transactions; personnel policy.
Insurer	Information about enumeration of public and private sector organizations that underwrite the cost of health care plans; a.k.a. payer. Insurer is a type of Health Care Stakeholder. Example(s): Medicare program; Medicaid program; Children's Health Insurance Program; managed care organizations; Veteran's Health Insurance program; Indian Health Service program; self-insured employer groups; private health insurance companies. Exclusion(s): services covered under benefit packages.
Location	Information about the logistical aspects of CMS program operations and administration.

*Table 4–1. Definition of Subject Areas (Continued)*

Subject area	Definition
Material_Resource	Information about all plant facilities and information technology components used to support CMS operations and program administration. Example(s): office furniture, leased equipment. Exclusion(s): inventories of printing and paper stock.
Partner	Information about the identification and management of parties, with which CMS has a formal agreement, that act as CMS's agents or partners in the operation and monitoring of CMS programs, helping to ensure that the public benefits from high-quality health care delivery. Partner is a type of Health Care Stakeholder. Example(s): contractors, grantees, State Survey Agencies, Peer Review Organizations, other quality improvement organizations, other Federal Agencies, States, territories, Indian Tribes, accrediting bodies.
Party	A generic collection of classes that includes all persons, organizations, and groups that are relevant in the health care environment. Example(s): persons or organizations that CMS interacts with, but with whom no formal agreement exists—e.g., beneficiary and consumer organizations, plan and provider interest groups. Exclusion(s): beneficiaries, providers, insurers, States, business partners.
Policy_&_Regulation	Information about administrative and programmatic policy and regulations either created by other agencies and referenced by CMS personnel, or created by CMS to be used in the administration and operation of health care programs. Includes information about rulings made by CMS's Administrator to clarify law and regulations pertaining to CMS programs. Example(s): coverage policy and regulations; payment policy and regulations; IT policy; personnel policy; Federal Acquisition Regulation; and CMS guidance/policy memoranda to State health officials and State Medicaid and CHIP program directors. Exclusion(s): Federal policy and regulations not relevant to CMS programs or personnel.
Provider	Information about persons or organizations responsible for, or involved in, the provision of medical services or supplies to an individual. Includes information such as identification, enrollment, certification, debarment, performance, and in the case of managed care organizations, payment. Provider is a type of Health Care Stakeholder. Example(s): physicians and other practitioners, physician/practitioner groups, institutions (such as hospitals, laboratories, and nursing homes), managed care organizations, and suppliers (such as pharmacies and medical supply companies). Exclusion(s): health industry workers who support the provision of health care but who do not provide health services, such as admissions and billing personnel, housekeeping staff, and orderlies.

SUBJECT AREA MODEL

The Subject Area Model is depicted in Figure 4-2. This simplified view is used to facilitate discussion with business components, and would be utilized in an implemented information gateway.

Figure 4–2. CMS Subject Area Model
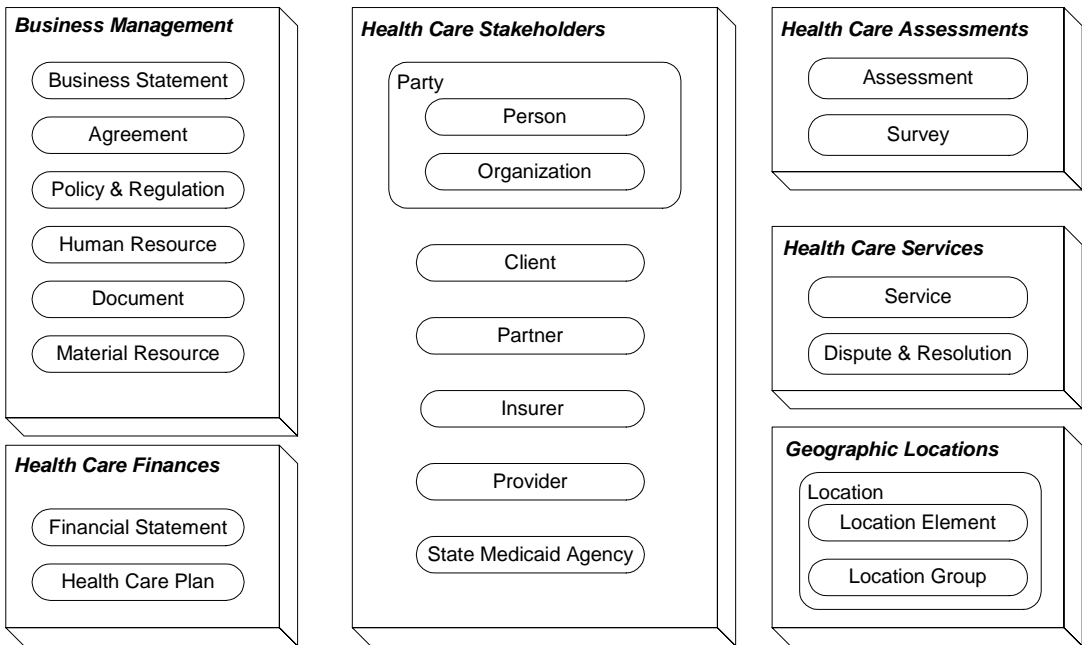
CMS's Subject Area Model has a nested structure. At the highest level, the subject areas identified in the previous section are grouped into logical collections to provide business context. Six subject area collections are defined:

- *Business Management* is a collection of subject areas related to the business management aspects of CMS program operations and administration.

- *Geographic Locations* is a collection of subject areas related to the logistical aspects of CMS program operations and administration.

- *Health Care Assessments* is a collection of subject areas related to assessments of CMS programs and health care delivery.

- *Health Care Finances* is a collection of subject areas related to the financial aspects of CMS program operations and administration.

- *Health Care Services* is a collection of subject areas related to delivery of health care services under CMS programs.

- *Health Care Stakeholders* is a collection of subject areas related to CMS stakeholders. Stakeholders are parties that are either directly impacted by or

involved in the operation and administration of CMS programs, or that otherwise have a vested interest in the quality of health care delivery.

INFORMATION MODEL

Subject areas are further decomposed into related groups of classes. A class is a set of objects that share a common structure and common behavior (the same attributes, operations, relationships and semantics). A class is an abstraction of real-world items. When these items exist in the real world, they are instances of the class and are referred to as objects. CMS's Information Model is presented in Figure 4–3 in the form of a UML Class diagram. This Class Diagram is work in progress; and represents high-level CMS-specific information that will be refined as further analysis is conducted. Rectangles representing the subject area collections contain the relevant classes.

The symbols used in a UML Class Diagram are as follows:
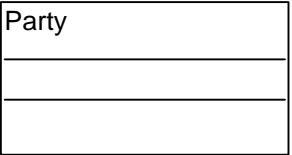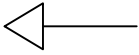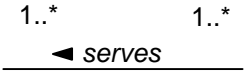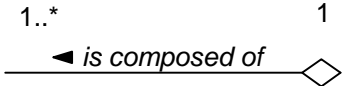
|	
Class Party	A class describes a set of objects with similar structure, behavior, and relationships. A class is defined by various properties, including, most notably, attributes and methods. The class is drawn as a rectangle with three compartments separated by horizontal lines. • In the first, top-most compartment is listed the name of the class and all general properties of the class, including its stereotype and whether it is abstract. • The second compartment contains a list of the class attributes. • The third compartment contains a list of the class methods.
Inheritance Line	Inheritance is an abstraction that enables to separate a class from one or more refined versions of the class. The refined versions of the class are called subclasses or derived classes. The class that the subclasses refine is called the superclass or base class. The subclasses are connected to the superclass by an inheritance line, represented by a triangle shaped notation on the line affixed to the superclass.
Association 1..* 1..* ◄ *serves*	An association is a structural relationship between classes that specifies that objects of one class are connected to objects of another class. An association is represented as a solid line drawn between the classes. Numbers at the ends specify the multiplicity. The name has an arrow next to it to indicate the direction the association needs to be read.
Aggregation 1..* 1 ◄ *is composed of* ◇	Aggregation specifies a relationship in which one class represents the components of a second class, and the second class constitutes the whole. It is represented by a diamond-shaped notation on the association line affixed to the class that makes up the whole.

Figure 4–3. CMS Information Model
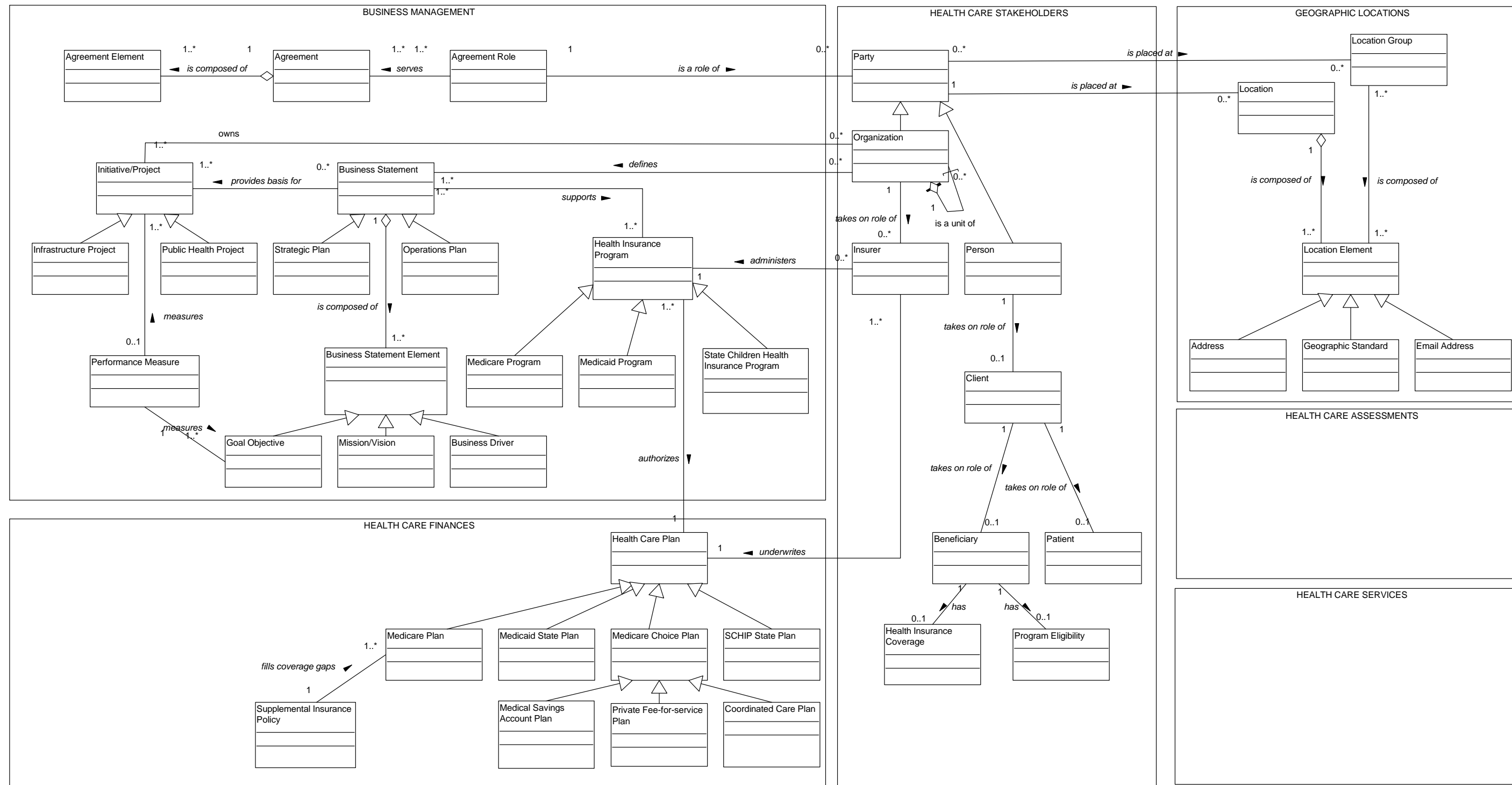
Note: The CMS Information Model is under development. In particular, the subject area collections named Health Care Assessments and Health Care Services have not been addressed yet.

INFORMATION CLASS DESCRIPTIONS

Table 4–2 lists the information classes shown in Figure 4–3, along with their descriptions.

Table 4–2. Description of Information Classes

Class name	Class description
Agreement	A formally documented legally binding or voluntary arrangement that exist between two or more parties, which specifies the roles and responsibilities of each in relation to support of CMS programs.
Agreement Element	A section or a part of an agreement which specifies the roles and responsibilities of each party, and describes some term or condition to which each of the parties have agreed to abide.
Agreement Role	A descriptive label for the set of responsibilities to be fulfilled by a party as described in an agreement. This class allows for the different types of roles that can exist across the different types of agreements to be identified.
Business Driver	Any factor, originating either internal or external to the organization, which influences the business' decisions about its direction and priorities.
Business Statement	A formal plan that defines aspects of an organization, such as function, strategic direction, budget, performance, plans related to legislated health care programs, assessment of the effectiveness of health care programs, or plans for providing the infrastructure to support CMS's business. Also referred to as business plan.
Business Statement Element	A section or component of a business plan defined by an organization.
Goal/Objective	A statement in a strategic or operations plan which describes "what is to be achieved" in a shorter time frame, as compared with a longer term Mission/Vision.
Infrastructure Project	A set of work whose objective is the betterment of population health and well being, indirectly through delivery of some component of the health system infrastructure or some service that supports the health system infrastructure.
Initiative/Project	A set of work whose objective is the betterment of population health and well being either directly through clinical study or intervention, or indirectly through delivery of some component of the health system infrastructure or some service that supports the health system infrastructure.
Mission/Vision	A part of a strategic-level plan that provides the highest level, long-range directional statement of where an organization should be in a set period of time.
Operations Plan	A formal document in which business managers describe tactical approaches for achieving the goals/objectives specified in the Strategic Plan.

Table 4–2. Description of Information Classes (Continued)

Class name	Class description
Performance Measure	A component of a business plan which describes measurable targets for goals/objectives described in the business plan, or for goals/objectives described for program initiatives/projects; the measure of performance used to assess achievement of goals and objectives.
Health Insurance Program	A program that helps beneficiaries pay for medical services.CMS runs three health insurance programs: the Medicare program, the Medicaid program, and the State Children Health Insurance program
Medicare Program	A program that provides health insurance to people age 65 and over, those who have permanent kidney failure, and certain people with disabilities.
Medicaid Program	A program through which a State assists in the provision of adequate medical care to eligible needy persons.
State Children Health Insurance Program	A program through which a State initiates and expands child health assistance to uninsured, low-income children.
Public Health Project	A set of work whose objective is the betterment of population health and well being through clinical study or intervention.
Strategic Plan	A formal document in which business managers describe strategies for the future, and prescribe, at least at a high level, how the expected goals/objectives of a plan are to be achieved.
Address	A part of a location which represents a component of address not included in the Geographic Standard. It is usually a street address.
E-Mail Address	Electronic mail location.
Geographic Standard	A geographic area defined or classified in law or having some official standing—e.g., State, County, ZIP Code, CMS Region.
Location	A physical place where an event occurs, or where a Party (organization or person) is located, may be contacted, conduct their business, etc. An actual physical location is normally made up of a number of components including an Address, plus a standardized geographic component, or a notational location grouping (e.g., region).
Location Element	A component of location that identifies the physical place associated with an organization or individual. An actual physical location is normally made up of a number of components including a street address, plus a geographic component (e.g., city, state, ZIP Code, country). Reference groupings are identified for standard geographic areas.
Location Group	A notional grouping of Location Element(s) to form a recognizable geographic designation. Examples are areas, regions and districts (e.g. South East) where these are not defined as a geographic standard, and postal addresses.

Table 4–2. Description of Information Classes (Continued)

Class name	Class description
Coordinated Care Plan	A plan offered by health maintenance organizations (with or without point of service options), Provider-Sponsored Organizations (PSOs) and Preferred Providers Organizations (PPOs), or religious fraternal benefits that meets the Medicare+Choice standards.
Health Care Plan	A collection of one or more sets of health care benefits provided for pre-determined cost-sharing amounts. Includes both public and private health plans.
Medicaid State Plan	A health plan through which a State assists in the provision of adequate medical care to eligible needy persons. Medicaid is the largest program providing medical and health-related services to America's poorest people.
Medical Savings Account Plan	A Medicare health plan option made up of two parts. One part is a Medicare MSA Health Insurance Policy with a high deductible. The other part is a special savings account where Medicare deposits money to help you pay your medical bills.
Medicare Plan	A traditional pay-per-visit (a.k.a. fee-for-service, or Original Medicare) arrangement available nationwide. This plan includes Part A and B provisions.
Medicare+Choice Plan	A plan (a.k.a. Medicare Managed Care) offered under a new Medicare program that allows for more choices among Medicare health plans. Everyone who has Medicare Parts A and B is eligible, except those who have End-Stage Renal Disease.
Private Fee-for-Service Plan	A plan that reimburses providers on a fee-for-service basis, does not place them at risk, does not vary payment rates based on utilization, and does not restrict provider selection among those who agree to accept the plan's payment terms and conditions.
SCHIP State Plan	A health plan through which a State initiates and expands child health assistance to uninsured, low-income children.
Supplemental Insurance Policy	A private health insurance/coverage policy purchased to supplement, or fill the gaps, in Medicare coverage. These types of private health insurance/coverage include: - Employee Coverage (from employer or union); - Retiree Coverage (from employer or union); and - Medigap Insurance (from a private company or group).
Beneficiary	A person that has applied for benefits under the Medicare program, or eligible to participate in the Medicaid or State Children's Health Insurance programs. Includes those persons approved for Medicare services (entitled), and those denied (non-entitled).
Client	A person who is scheduled to receive, is receiving, or has received health care services.
Health Insurance Coverage	A status and/or period(s) a person is enrolled in a health insurance plan (public or private).

Table 4–2. Description of Information Classes (Continued)

Class name	Class description
Patient	A person who is scheduled to receive, is receiving, or has received health care services. This person may or may not also be a Beneficiary.
Program Eligibility	a status and/or period(s) a person is qualified to participate in one of CMS's health insurance programs.
Insurer	A public or private sector organization that underwrites the cost of a health care (insurance) plan.
Organization	An entity that is established under law and is allowed to exist either as a profit or a non-profit business concern.
Party	A person or organization that is either directly impacted by, or involved in the operation and administration of CMS programs; or that otherwise has a vested interest in the quality of health care delivery. Some parties play one or more specific roles within the health system (e.g., Beneficiary, Provider).
Person	An individual that is uniquely identifiable through a birth record, or other authoritative record held within the archives of the national government.

LOGICAL DATABASES

A central core of well-managed databases is a key component of the information environment. A set of logical databases has been derived from the subject areas defined in the Information Model Framework. The subject areas provide a classification scheme for CMS's information assets, identifying the major types of information serving CMS's business functions. This section describes the logical set (may represent multiple physical databases at implementation) of large-volume, transactional databases that support CMS's major operations. They support large-volume batch and online transaction processing operations, and provide the raw, detail-level data that is integrated in analytical data stores. Most of CMS's transactional data originates beyond the enterprise boundary. This has implications for information management, particularly in the area of quality control. Eight logical subject-specific databases have been defined for the CMS's information architecture.

◆ *Beneficiary Database* contains data about individuals entitled to benefits under CMS's Medicare program. This logical database comprises the master list of Medicare beneficiaries, including managed care enrollees and dual-eligible persons. Content includes attributes such as personal characteristics, race/ethnicity, eligibility type, and coverage and benefit package selection.

◆ *End-Stage Renal Disease (ESRD) Database* contains data about dialysis and kidney transplant services, above and beyond that which is contained in a Medicare claim, rendered to an individual.

- *General Ledger Database* contains national accounting and financial data across all CMS business functions, serving as the primary vehicle for developing the numerous internal and external financial reports for which CMS is responsible for providing to its constituents.

- *Health Care Plan Database* contains data about plan options and health care benefits offered by public and private health insurance payers; includes detail regarding covered services under various benefit packages, as well as premium and service pricing schedules.

- *Insurer Database* contains data about public and private organizations that have negotiated Coordination of Benefits Agreements with CMS to exchange eligibility, claims, and encounter data.

- *Provider Database* contains data about persons or organizations responsible for, or involved in, the provision of medical services or supplies to an individual. Contents include attributes pertaining to identification, enrollment, certification, debarment, performance, and payment.

- *Survey Database* is the primary source of raw data that feeds analytical data stores supporting program and outcome assessment/evaluation. It contains data collected to:

  - Support provider and Clinical Lab certification.

  - Develop quality indicators, provider and State Survey Agency performance measures, and health care outcome measurements.

  - Enable assessment of beneficiary functional status and wellness.

  - Support understanding of beneficiary health care decision-making and satisfaction levels.

  - Enable benefit analysis of covered or proposed program services and payment.

- *Utilization Database* contains data about medical diagnosis/procedure determinations and medical supply dispersal made during the course of a medical encounter between a health care provider and a Medicare beneficiary. It includes detailed data pertaining to Medicare claims.

One or more logical databases are needed to address persons covered under the Medicaid and Children's Health Insurance programs, as well as utilized services. These topical areas are merged with Medicare in the subject areas, but would be treated as distinct logical databases in the operational environment. This issue will be addressed as requirements in this area are better understood. Logical databases for some administrative and analytical support functions have not yet been defined. Table 4–3 contains a mapping between logical databases and subject areas.

Table 4–3 Relationship of Subject Areas to Logical Databases

Information (Subject areas)	Beneficiary	End-Stage Renal Disease	General Ledger	Health care plan	Insurer	Provider	Survey	Utilization	Administrative and analytical support data stores
Agreement									X
Assessment									X
Business_Statement									X
Client	X								
Dispute_&_Resolution									X
Document									X
Financial_Statement			X						
Health_Plan				X					
Human_Resource									X
Insurer					X				
Location									*
Material_Resource									X
Partner									X
Party									*
Policy_&_Regulation									X
Provider						X			
Service		X					X		
State_Medicaid_Agency									X
Survey							X		

* Location and Party are generic subject areas used in the Information Model Framework to stage common, reusable definitions of geographic data.

RELATIONSHIP OF SUBJECT AREAS TO BUSINESS FUNCTIONS

Table 4–4 depicts the relationships between subject areas and the business functions. The cells of the table contain the letters C or R. *C* indicates that the function *creates* data contains in the subject area; *R* indicates that the function *reads* data contained in the subject area. For example, Table 4–4 shows that the "Maintain Medicare beneficiary enrollment" (numbered 3.1) function creates beneficiary data in the Client Subject Area, while the "Manage program data and statistics" (numbered 2.7) function can only read these data.

Table 4–4. Relationship of Subject Areas to Business Functions

Subject areas	1.1 Manage strategic planning	1.2 Provide organizational management	1.3 Assess programs	1.4 Manage investments	2.1 Manage partner relationship policy development	2.2 Provide actuarial services	2.3 Manage Medicare beneficiary enrollment policy development	2.4 Manage Medicaid/SCHIP beneficiary eligibility policy development	2.5 Manage payment policy development	2.6 Manage coverage policy development	2.7 Manage program data and statistics	2.8 Manage research and evaluation	2.9 Manage demonstration projects	2.10 Manage legislative activities and regulation development	2.11 Manage Medicare claims appeals, grievances and complaints policy development	2.12 Manage quality of care/utilization review policy development	2.13 Manage program integrity policy development	2.14 Manage policy development for participation of providers	3.1 Maintain Medicare beneficiary enrollment	3.2 Manage Medicaid and SCHIP entitlement/eligibility and maintenance	3.3 Manage provider enrollment	3.4 Determine managed care organizations eligibility	3.5 Manage Medicare contractors	3.6 Manage peer review and ESRD network contractors	3.7 Process Medicare claims	3.8 Manage claims pricing	3.9 Oversee State health insurance	3.10 Coordinate benefits	3.11 Process Medicare appeals, grievances, and complaints
Agreement					R							R	R						R	R	R	R	R	R			R	R	R
Assessment																R													
Business_Statement	C	C	C	C	C	C	C	C	C	C	R	C	C	C													R		
Client					R	R	R		R	R												C	C		C		R	C	R
Dispute_and_Resolution															R														C
Document	C	C	C	C	C	C	R	R	R	R	C	C	C	C	R	R	R	R	C	C	C	C	C	C	C	C	C	C	R
Financial_Statement	C				R				R																				
Health_Care_Plan											R											C			R			R	R
Human_Resource		R	R																										
Insurer					R						R							R				C			R			R	R
Location																			R	R	R	R	R	R	R	R			
Material_Resource			R		C					C				R															
Partner					R								R									C	C						R
Party		C										R																	
Policy_and_Regulation							C	C	C	C						C	C	C											R
Provider					R						R										R		C	C	R	R			R
Service					R						R							R							C	C	R		R
State_Medicaid_Agency																												C	
Survey																R													

Note: C = create, R = read, U = update, D = delete.

Subject areas	4.1 Monitor contractor administrative budget and costs	4.2 Manage premium collection	4.3 Manage benefit payment accounting	4.4 Manage Medicare contractor banking	4.5 Manage provider financial management	4.6 Manage provider cost reports	4.7 Manage MCO payment and fee collection	4.8 Manage debt collection accounting	5.1 Review post payment	5.2 Monitor utilization	5.3 Conduct medical review	5.4 Manage fraud, waste, and abuse	5.5 Conduct Medicare secondary payer review	5.6 Monitor compliance	6.1 Manage State plan approval	6.2 Maintain Medicaid and SCHIP budgets	6.3 Evaluate State performance	6.4 Fund State Medicaid and SCHIP	6.5 Manage State Medicaid program and SCHIP initiatives	6.6 Provide Medicaid drug rebate management	6.7 Manage system certification	7.1 Manage congressional relations	7.2 Manage media relations	7.3 Manage intergovernmental relations	7.4 Manage health care industry relations	7.5 Manage beneficiary representative organization relations	7.6 Manage employer group relations	7.7 Manage State relations	8.1 Manage administrative finance	8.2 Manage human resources	8.3 Manage information distribution	8.4 Manage contractors and procurement	8.5 Manage facilities	8.6 Provide information technology (IT) management and services
Agreement	R	R	R	R	R	R	R	R	R				R	R	C	R	R		C	R	R		R	R	R	R	R	R		R	R	C	R	R
Assessment											R																							
Business_Statement																R		R	C											R	R			C
Client		R							R			R	R						C		R	R												
Dispute_and_Resolution																						C												
Document	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Financial_Statement	C	C	C	C	C	C	C	C	R			C				C		R	C												C		C	
Health_Care_Plan									R					R																				
Human_Resource																														C				
Insurer									R		R			R	R																			
Location											R			R																				
Material_Resource																						R	R	R	R	R	R	R				R	C	C
Partner	R	R	R	R								R	R		R							R										C	R	R
Party											R		R										R	R	R	R	R			R				
Policy_and_Regulation														R			R																	
Provider					R	R	R		R	R				R																		R		
Service	R		R						R		R	R	R	R					R															
State_Medicaid_Agency																C		C	R	R	R	C						R						
Survey																																		

Note: C = create, R = read, U = update, D = delete.

Table 4–4. Relationship of Subject Areas to Business Functions (Continued)

Subject areas	9.1 Perform policy change impact analysis	9.2 Determine health care requirements	9.3 Provide public/beneficiary awareness and assistance	9.4 Manage beneficiary communication	9.5 Manage customer outreach	10.1 Develop electronic data interchange standards	10.2 Develop unique identifiers	10.3 Participate in standard forms development	10.4 Participate in health care industry standard code development	10.5 Participate in information technology (IT) industry standards development	11.1 Provide quality protection	11.2 Improve quality
Agreement			R	R	R	R	R	R	R	R	R	R
Assessment											C	C
Business_Statement	C	C				C	C	C	C	C		
Client			R	R								
Dispute_and_Resolution		R	C	C	C							
Document	C	C	C	C		C	C	C	C	C	C	C
Financial_Statement												
Health_Care_Plan				R								
Human_Resource												
Insurer				R								
Location												
Material_Resource												
Partner			R	R	R						R	R
Party			R		R	R	R	R	R	R		
Policy_and_Regulation	C											
Provider				R							R	R
Service				R								
State_Medicaid_Agency												
Survey		C	C		C						R	R

Note: C = create, R = read, U = update, D = delete.

Chapter 5
Application Architecture

The application architecture identifies and describes applications and modules, as well as their relationships to business processes and other applications systems and modules. Major influences on the application architecture include technologies employed, operations processes, and interface requirements. Analysis of current business applications forms the basis for identifying applications that better support the current and future business processes. Moreover, through analysis of each application vis-à-vis its business processes, an organization can determine the overall impact of changing any individual application.

APPLICATION INVENTORY

CMS inventoried the applications it used to perform its operations through ESID database. At the time of publication, a total of 231 applications and 73 aliases[1,2] were identified. Of the 231 applications, 22 (10 percent) are still in development. They are as follows:

AGGS	MDDM	QIES
CMIS	MDM	REMAS
EXPERTS	MMCS	REMIS
HCMS	MPD	RRS
ICRDB	NMUD	SGR
LABREL	NPS	WFPS
LERT	OEOCR	
MBD	PIXL	

Table 5-1 shows the number and percentage of applications owned by each organizational entity, broken out by groups or subordinate organizations, and Table 5-2 provides a detailed inventory of CMS applications sorted by application name.

Table 5-1. Number of Applications Owned by CMS Organizational Entities

Organizational entity	Number of applications	Percentage of total applications
Center for Beneficiary Choices	30	13%
Beneficiary Information Services Group	12	
Demonstration and Data Analysis Group	7	
Health Plan Benefits Group	6	
Health Plan Policy Group	2	
Partnership and Promotion Group	1	
Quality Measurement and Health Assessment Group	1	
Southern Consortium Contractor Management Staff	1	
Center for Medicaid and State Operations	16	7%
Disabled and Elderly Health Program Group	1	
Family and Children's Health Program Group	2	
Finance, Systems and Quality Group	9	
Survey and Certification Group	4	
Center for Medicare Management	24	10%
Benefits Operations Group	7	
Medicare Contractor Integrity and Performance Group	1	
Medicare Contractor Management Group	2	
Provider Billing and Education Group	1	
Purchasing Policy Group	9	
Center for Medicare Management	1	
Chronic Care Policy Group	3	
Office of Clinical Standards and Quality	11[a]	5%
Coverage and Analysis Group	1	
Information System Group	9	
Office of Communications and Operations Support	5	2%
Executive Council and Special Initiatives Group	1	
Operations Support Group	4	

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[1] Alias identifies alternate projects or names by which a system (or a functional component of a system, i.e., subsystem) is or was historically known, and their business context.

[2] A total of 59 retired and three pending applications are not documented in the inventory.

Table 5-1. Number of Applications Owned by CMS Organizational Entities (Continued)

Organizational entity	Number of applications	Percentage of total applications
Office of Financial Management	45[a]	19%
Accounting and Risk Management Group	4	
Budget and Analysis Group	5	
Financial Services Group	17	
Program Integrity Group	17	
Office of Information Services	41[a]	18%
Business Systems Operations Group	9	
Enterprise Databases Group	17	
Investment Planning and Management Group	2	
Security and Standards Group	1	
Systems Quality Group	1	
Technology Infrastructure Group	8	
Office of Internal Customer Support	17	7%
Acquisition and Grants Group	3	
Administrative Programs Systems Staff	3	
Administrative Services Group	2	
Human Resources Management Group	6	
Learning Resources Group	3	
Office of Strategic Planning	7[a]	3%
Information and Methods Group	1	
Research and Evaluation Group	2	
Systems Technical and Analytic Resources Group	3	
Office of the Actuary	6[a]	3%
Division of Medicare and Medicaid Cost Estimates	3	
National Health Statistics Group	1	
Office of Equal Opportunity and Civil Rights	1	0%
Office of the Atlanta Regional Administrator	12	5%
Office of the Chicago Regional Administrator	5	2%
Office of the Dallas Regional Administrator	5	2%
Office of the Denver Regional Administrator	1	0%
Office of the Kansas City Regional Administrator	1	0%
Office of the New York Regional Administrator	1	0%
Office of the San Francisco Regional Administrator	2	1%
Unknown	1	0%

[a] These organizational entities have some applications that support them but are not tied to a particular group or subordinate organization.

Table 5–2. Application Inventory

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
AAPCC		Adjusted Average Per Capita Cost System	Health care services information system	Medicare pricing systems	System that calculates the HMO payment rates for every state by county (AAPCC). This is based on the cost Medicare would have incurred if enrollees had received services in the fee-for-service system in their own area. The value is used to make payments in advance to eligible organization for each eligible individual enrolled. The system models data for the PPS and projects data for future payment rates (i.e., 1995 data is being used to calculate payment rates for 1997 using cost adjustments from OACT - Actuary).	Medicare and Medicaid Cost Estimates Group	Medicare and Medicaid Cost Estimates Group
ADR		Automated Desk Review Software	Health care services information system	Medicare financial management and payment systems	System that supports the Fiscal Intermediaries in completing the cost report and settlement processes.	Enterprise Databases Group	Administrative Programs Systems Staff
AGGS		AGG Solicitation System	Business management information system	Procurement and property management systems	In development. AGG Solicitation System	Acquisition and Grants Group	
ALJTrack		ALJ Tracking System	Unknown	Unknown	System that tracks Administrative Law Judge (ALJ) Court of Appeals cases submitted by NY RO staff and Empire Medical Services to support appeals processing.	Office of the New York Regional Administrator	Office of the New York Regional Administrator
APASS		Arkansas Part A Shared System	Utilization data management system	Medicare claims processing standard systems	Systems that CMS contractors use to process Medicare claims related to medical care provided by hospitals and hospital-based physicians. It is being used by six contractors at seven locations, with its consolidated input being processed at two data centers (BCBS Arkansas and Mutual of Omaha). APASS has the following capabilities: process adjudicated, suspended, and unprocessed claims Calculate claims processing timeliness (CPT) interest; offset payables with receivables; hold claims on the floor awaiting payment Interface with the Common Working File (CWF) for claim information validation, transmittal of payment data to another system for processing, and generation of claims management reports.	Business Systems Operations Group	Business Systems Operations Group
	ARKA	Arkansas Part A System	Utilization data management system	Medicare claims processing standard systems	Acronym used in early Y2K inventory.	Business Systems Operations Group	Business Systems Operations Group
APPS		Automated Plan Payment System (GHP)	General ledger data management system	Managed care systems	Accounting package that calculates monthly payments for HMOs, CMPs, and the HCPPs based on the enrollment maintained by the GHP system. An audit trail is kept to verify that complete, timely and accurate payments are made.	Health Plan Benefits Group	Health Plan Benefits Group
APS		Annual Person Summary System	Health care services information system	Medicare utilization data collection and access systems	System that takes claim information and enrollment data and manipulates it to find out how many of each type of service were performed for each year per beneficiary (i.e. how many heart surgeries were performed for 1994, etc.).	Systems Technical and Analytic Resources Group	Enterprise Databases Group
ASCPRICER		Ambulatory Surgical Center Pricer	Health care services information system	Medicare pricing systems	Prices for Ambulatory Surgical Center claims.	Purchasing Policy Group	Demonstration and Data Analysis Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
ASPEN		Automated Survey Processing Environment also known as ASPENWIN	Provider data management system	Health care quality systems	System used to produce survey and certification data gathering forms and reports during inspections by State Survey Agency staff; generates report of survey findings and letter to facility.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
ATARS		Audits Tracking and Reporting System	Business management information system	Administrative finance systems	System used by management analysts in the Audits Liaison Staff to track and report on internal and external audits. These audits can have various recommendations with corrective action plans for each recommendation. Several audits findings result in monies being collected. These audits are reported to the department through the semi-annual reports.	Operations Support Group	Budget and Analysis Group
BAAADS		Budget Apportionment, Allotment, and Allowance Database System	General ledger data management system	Administrative finance systems	System that controls and tracks CMS's budgeted appropriations, allotments, and allowances throughout CMS. Used by Administrative Budget Branch to record the budget and disperse the funds by Advice of Allotments and Allowances. The system transfers the budget amounts to the Financial Accounting Control System (FACS).	Financial Services Group	Budget and Analysis Group
BBATS		Balanced Budget Amendment Tracking System	Unknown	Unknown	Balanced Budget Amendment Tracking System.	Investment Planning and Management Group	
BCT		Budget Control Table	Business management information system	Administrative finance systems	System that supports multiple budget cycle detailed information on a multitude of categories of spending. For future year cycles, various versions of budget proposals based on differing criteria must be prepared and retained. The Budget Control Table is central to all budget formulation work.	Budget and Analysis Group	Budget and Analysis Group
BESS		Part B Medicare Extract and Summary System	Health care services information system	Medicare utilization data collection and access systems	System that provides data used to evaluate Part B procedures, monitor contracting, allocate resources, prepare impact statements, and develop budget and legislative proposals and congressional reports, and medical reviews. Summarization of Part B data procedure code based - number of procedures performed and typical cost of procedure (e.g., "How many claims were filed in Ohio last year?").	Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
	B_CARRIERS		Health care services information system	Medicare utilization data collection and access systems		Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
	FMRS	Carrier Focused Medical Review Subsystem Also known as FMRS	Health care services information system	Medicare utilization data collection and access systems		Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
	PARTB_DATA		Health care services information system	Medicare utilization data collection and access systems		Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
BISC		Beneficiary Integrity Support Center System	Unknown	Unknown	Beneficiary Integrity Support Center System.	Program Integrity Group	Program Integrity Group
EMS		Ethics Management System	Human resources information systems	Human resource management system	Ethics Management System.	Administrative Programs Systems Staff	Administrative Programs Systems Staff

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
BUCS		Budget Under Control System	Business management information system	Administrative finance systems	CMS-wide budget execution system used by administrative staffs to monitor their funding and spending. BUCS allows components to break down their budget into various budget categories (i.e. supplies, training, travel) and component levels (i.e. Group, Division). Spending transactions are recorded under their budget categories ensuring that they do not overspend their budget.	Budget and Analysis Group	Budget and Analysis Group
CACTS		Congregational and Correspondence Tracking System	Unknown	Unknown	Congregational and Correspondence Tracking System.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
	CCS	Congregational Correspondence Control System	Unknown	Unknown		Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
CAFM		Contractor Administrative Budget and Financial Management System	General ledger data management system	Medicare financial management and payment systems	System that manages contractor reporting activities pertaining to the planning and budgeting of administrative services and operational endeavors, the expenditures of administrative and benefit funds, and the reconciliation of planned-to-actual expenditures. Continues to be the vehicle for tracking all benefit payments, banking issues, and CFO data, as well as historical budget data (prior to 1998).	Financial Services Group	Budget and Analysis Group
CAFMII		Contractor Administrative Financial Management System	Health care finance information system	Medicare financial management and payment systems	System that serves as the main vehicle for planning, administering and monitoring the administrative expenses of the Medicare contractor community. Contains budget data from 1998 to present.	Financial Services Group	Budget and Analysis Group
CASE-T		Case-Tracker	Beneficiary data management system	Medicare financial management and payment systems	System that tracks cases filed by hospitals to appeal geographic classifications under the Prospective Payment System.	Technology Support Group	
CASR		Contractor Audit and Settlement Reporting System	Health care finance information system	Medicare financial management and payment systems	System that tracks budgeted and incurred costs by type of activity and type of provider for Part A Medicare contractors. This is used for reporting the cost effectiveness and/or savings of the audit and settlement functions. The contractors utilize the System Tracking of Audit and Reimbursement (STAR), a PC software package, to record a multitude of audit related data.	Financial Services Group	Budget and Analysis Group
CATS		Clinical Abstraction Tracking System	Survey data management system	Health care quality systems	Clinical Abstraction Tracking System.	Information System Group	Information System Group
CC2K		Case Control 2000	Unknown	Unknown	Dallas RO Case Control System.	Office of the Dallas Regional Administrator	Office of the Dallas Regional Administrator
CCI		Correct Coding Initiative	Unknown	Unknown	Correct Coding Initiative.	Demonstration and Data Analysis Group	
CCL		COBRA Complaint Log	Document/collaboration information system	Unknown	Internal tracking system for COBRA complaints and EMTALA.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
CERT		Comprehensive Error Rate Testing	Unknown	Unknown	Comprehensive Error Rate Testing Program.	Program Integrity Group	Program Integrity Group
CHKTRK		Check Track	Unknown	Unknown	Check Track.	Office of the Chicago Regional Administrator	Office of the Chicago Regional Administrator
CIS		Customer Inquiry System	Document/collaboration information system	IT management system	System that tracks and manages correspondence from beneficiaries and other sources (customers). Includes a document management system.	Operations Support Group	Technology Support Group
CLD		ClmDelay.xls	Unknown	Unknown	ClmDelay.xls.	Health Plan Policy Group	Health Plan Benefits Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
CLFS		Clinical Laboratory Fee Schedule	Health care services information system	Medicare pricing systems	Part B pricing system that maintains, updates, and disseminates Part B pricing data for services priced under clinical lab fee schedule. Pricing is legislatively mandated.	Purchasing Policy Group	Demonstration and Data Analysis Group
CLTS		HCFA.GOV Clearance Tracking System	Unknown	Unknown	HCFA.GOV Clearance Tracking System.	Beneficiary Information Services Group	Beneficiary Information Services Group
CMAN		Conference Bridge, Meet-me	Unknown	Unknown	Conference Bridge, Meet-me.	Technology Infrastructure Group	Technology Infrastructure Group
CMDB		Configuration Management Database	Unknown	IT management systems	Configuration Management Database - Infrastructure (Tammy Riggs).	Technology Infrastructure Group	
CMHS		Continuous Medicare History Sample System	Health care services information system	Medicare utilization data collection and access systems	System that evaluates the effectiveness of carrier claims processing performance and provides management information needed to improve the quality of claims processing on a person level.	Office of Strategic Planning	Purchasing Policy Group
CMIS		Contractor Management Information System	Health care services information system	Medicare financial management and payment systems	In development (CROWD replacement). System will support CMS in effectively managing and overseeing the operations of its Medicare fee-for-service contractors.	Medicare Contractor Management Group	Budget and Analysis Group
CMPTS		Civil Monetary Penalty Tracking System	Health care finance information system	Payment quality review systems	System that provides control over those civil monetary penalty cases that are to be collected by CMS. The Office of the Inspector General (OIG) negotiates with respondents who are accused of defrauding the government on Medicare and Medicaid payments. In some cases, a civil monetary penalty agreement is negotiated by both parties, and a payment plan is initiated. The payments by the respondents are either made to CMS or another party specified by the OIG. These payments must be controlled to ensure proper collection.	Program Integrity Group	Budget and Analysis Group
CONTACTS		Important Contacts Database	Human resources information system	Customer service systems	Interactive Internet database that provides customers (beneficiaries) with information pertaining to Medicare related phone numbers and contact information on Medicare partners throughout the country. (Medicare.Gov)	Beneficiary Information Services Group	Beneficiary Information Services Group
CPE		Contractor Performance Evaluation Database	Health care finance information system	Medicare financial management and payment systems	System that supports the tracking and evaluation of CMS's Medicare contractors (fiscal intermediaries and carriers). Used by CMS staff to prepare, write, and complete CPE Review Plans and Reports. It also is used to provide Central Office and Regional Office leadership with management reports that note CMS's progression through the FY 2001 CPE review process. The database is mandatory for use for all CPE Reviews.	Medicare Contractor Integrity and Performance Group	Medicare Contractor Integrity and Performance Group
CROWD		Contractor Reporting of Operational and Workload Data System	Health care services information system	Medicare financial management and payment systems	System that collects and reports on operational and contractor workload data and types of claim processed for Part A and B contractors. Summary data from each contractor dealing with types of claims, over all number of claims, processing cost per claim, and similar information is provided to the CROWD system.	Budget and Analysis Group	Budget and Analysis Group
CSAMS		Customer Service Assessment and Management System	Unknown	Unknown	Customer Service Assessment and Management System.	Beneficiary Information Services Group	Beneficiary Information Services Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
CTS		Correspondence Tracking System	Document/collaboration information system	Unknown	Correspondence Tracking System.	Office of the Denver Regional Administrator	Office of the Denver Regional Administrator
CWF		Common Working File System	Utilization data management system	Medicare claims processing standard systems	System that uses localized databases, maintained by host contractors, to validate pre-payment Medicare claims and to coordinate Medicare Part A and B benefits. Also provides contractors with beneficiary entitlement and utilization data.	Business Systems Operations Group	Business Systems Operations Group
CWFMQA		Common Working File Medicare Quality Assurance System	Utilization data management system	Medicare utilization data collection and access systems	System that validates CWF claims data for consistency, utilization, enrollment/duplicate checking, and frequency distribution. The CWF Basic Quality Assurance System supports NCH analysis on beneficiary billing data. It identifies inaccurate data to be corrected by the carriers, and sends accurate data to the NCH.	Enterprise Databases Group	Enterprise Databases Group
DAT		Enterprise Data Management System	Unknown	IT management systems	Enterprise Data Management System.	Enterprise Databases Group	Enterprise Databases Group
DB		Enrollment Direct Billing System	General ledger data management system	Medicare beneficiary enrollment systems	Financial management system, integrated into the Enrollment Database that maintains the Medicare premium liability information. Explicit beneficiary-identifiable data are required to manage this billing and collection operation.	Benefits Operations Group	Business Systems Operations Group
DCS		Delinquent Debt Collection	Health care finance information system	Administrative finance systems	System that tracks and reports delinquent debt owed to DHHS to the Treasury Department via PSC, a collection agency.	Financial Services Group	Budget and Analysis Group
DD		Doctor D	Unknown	Unknown	Doctor D.	Systems Technical and Analytic Resources Group	Systems Technical and Analytic Resources Group
DESY		Data Extract System	Health care services information system	Medicare utilization data collection and access systems	CMS Enterprise Data Extract System that creates extract files from CMS source data (e.g., National Medicare Utilization Database).	Enterprise Databases Group	Enterprise Databases Group
DFC		Dialysis Facility Compare	Health care assessment information system	Customer service systems	Interactive Internet database that provides customers (beneficiaries) with information pertaining to Medicare approved dialysis facilities. (Medicare.Gov)	Beneficiary Information Services Group	Beneficiary Information Services Group
DIAL		Dial By Name	Unknown	Unknown	Dial By Name.	Technology Infrastructure Group	Technology Infrastructure Group
DMEFS		Durable Medical Equipment Fee Schedule	Health care services information system	Medicare pricing systems	System that maintains, updates, and disseminates part B pricing data for services priced under Durable Medical Equipment - Prosthetics, Orthotics, and Supplies (DME - POS) fee schedules. Generates rates for Level 2 HCPCS codes. Legislatively mandated.	Chronic Care Policy Group	Demonstration and Data Analysis Group
DNMNTR		Denominator System	Beneficiary data management system	Medicare beneficiary enrollment systems	System that provides for creation of the Denominator file, a skeleton entitlement and enrollment file that contains data on all Medicare beneficiaries with entitlement in a given year.	Business Systems Operations Group	Business Systems Operations Group
DPC		DPC Control System (Assignment Tracking System)	Unknown	Unknown	DPC Control System (Assignment Tracking System).	Chronic Care Policy Group	Chronic Care Policy Group
DPPS		Duplicate Payment Plan System	Health care finance information system	Payment quality review systems	System used to document cases in which Medicare and another insurer both made primary insurance payments to providers and beneficiaries. Also tracks recovery of these duplicate payments.	Financial Services Group	Budget and Analysis Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
DPS		Demonstration Payment System	General ledger data management system	Medicare financial management and payment systems	System that serves as an umbrella for a number of demonstration payments systems: Community Nursing Organization, Staff Assisted Home Dialysis, Lifestyle Modification Program and Municipal Health Service Program demonstrations, etc.	Financial Services Group	Budget and Analysis Group
	CNO	Community Nursing Organization	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	HAD	Staff Assisted Home Dialysis	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	LMP	Lifestyle Modification Program	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	MHS	Municipal Health Services Program	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	MSH	Minnesota Senior Health Options	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	OLK	On Lok's Risk Based Community Care Organization for Dependent	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	PAC	Program for All-Inclusive Care for the Elderly	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	PCD	Primary and Consumer Directed Care demonstration	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
	WPP	Wisconsin Partnership Program	General ledger data management system	Medicare financial management and payment systems	Subsystem of DPS.	Financial Services Group	Budget and Analysis Group
DQD		Data Quality Desk System	Business management information systems	IT management system	System that supports tracking of CMS data quality issues.	Office of Information Services	Office of Information Services
DSA		Division of State Operations Access Application	Unknown	Unknown	Division of State Operations Access Application.	Office of the San Francisco Regional Administrator	Office of the San Francisco Regional Administrator
DSAF		Decision Support Access Facility System	Health care stakeholder information system	Medicare utilization data collection and access systems	System that provides extract capability to a variety of Medicare enrollment and utilization data sources. DSAF provides data at a state-specific level.	Enterprise Databases Group	Enterprise Databases Group
ECP		External Customer Profile	Unknown	Unknown	External Customer Profile.	Office of the Dallas Regional Administrator	Office of the Dallas Regional Administrator
EDBS		Enrollment Database System	Beneficiary data management system	Medicare beneficiary enrollment systems	System that supports Medicare enrollment and premium collection functions, through the maintenance of records for all individuals who currently are (or who were at some time) entitled to Medicare benefits.	Benefits Operations Group	Business Systems Operations Group
	AIF	Application Interface Facility	Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS. Core data access subsystem.	Benefits Operations Group	Business Systems Operations Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
	BERT	Medicare Enrollment Database Query	Beneficiary data management system	Medicare beneficiary enrollment systems	Online subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	DIRT	Medicare Entitlement Update Exceptions Manager	Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	EDBO	Online Functions of the Enrollment Database	Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	ERNIE	Medicare Enrollment Database Update	Beneficiary data management system	Medicare beneficiary enrollment systems	Online subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	ETBDODFT		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETBFANIT		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETBHIPRO		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETQCWFRP		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETQCWFSS		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETQMONTH		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETUCWFDY		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETUDAM		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETUMMAIN		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETUMUP		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETUNOT12		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETUNOTHI		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
	ETURRB1		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	ETUSSAQD		Beneficiary data management system	Medicare beneficiary enrollment systems	Muppet processor.	Benefits Operations Group	Business Systems Operations Group
	GEP	General Enrollment Period Subsystem (also known as GES)	Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	HICARD		Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	IEQ		Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	LBRS	Lock Box Remittance	Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	MEDB	Manage Enrollment Database System	Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	MSP	Medicare Secondary Payer	Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS.	Benefits Operations Group	Business Systems Operations Group
	WORKBENCH		Beneficiary data management system	Medicare beneficiary enrollment systems	Subsystem of EDBS. Customer data extract and view management facility.	Benefits Operations Group	Business Systems Operations Group
EMCSES		Electronic Media Claims Standard Enforcement Software	Utilization data management system	Medicare claims processing standard systems	System that supports detection of programming inconsistencies and errors in the software developed for Medicare contractor use to implement the EDI standards required under the Administrative Simplification provisions of HIPAA. EMCSES is designed to edit billing formats prepared by providers; assist in testing provider changes to existing and new formats, especially for Y2K; monitor the accuracy of contractor prepared remittance advice formats. It includes support for the following specifications; UB 92 version 5; NSF Claim version 2.0; NSF Claim version 3.01; NSF Remittance version 2.01; X12 837 versions 3051.3 B; and 3051.3A.01; X12 835 versions 3051.4A.01A and 3051.4B.	Systems Quality Group	Systems Quality Group
EPSDT		Early and Periodic Screening, Diagnosis, and Treatment System	Health care stakeholder information system	Medicaid and state children's health insurance systems	System that supports the annual Early and Periodic Screening, Diagnostic and Treatment (ESPDT) Report (Form HCFA-416), which provides basic information on participation in the Medicaid child health program. The information is used to assess the effectiveness of state EPSDT programs in terms of the number of children (by age group and basis of Medicaid eligibility), who are provided child health screening services, are referred for corrective treatment, and the number receiving dental services.	Family and Children's Health Program Group	Finance, Systems and Quality Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
ESID		Enterprise Systems Inventory Database System	Business management information systems	IT management system	Centralized repository for information regarding CMS's automated business application systems that serves as the master list of all enterprise-class application systems. Descriptive data, including identification, status, and organizational contact(s), is accessible to any HCFANet user.	Office of Information Services (Information Technology Architecture Staff)	Office of Information Services (Information Technology Architecture Staff)
ESRD-CIP		End Stage Renal Disease Core Indicators Project	Unknown	Unknown	End Stage Renal Disease Core Indicators Project.	Office of Clinical Standards and Quality	
ESTS		Enrollment Statistical Tabulation System	Health care stakeholder information system	Medicare beneficiary enrollment systems	System that produces statistics for enrollment data for Medicare only. This is an annual and quarterly system whose output is used for CMS publications and outside researchers.	Security and Standards Group	Security and Standards Group
EXPERTS		CMS Experts List	Human resources information system	Human resource management systems	In development. CMS Experts List.	Executive Council and Special Initiatives Group	
FACS		Financial Accounting and Control System	General ledger data management system	Administrative finance systems	Major CMS financial system that provides automated funds control and supports the general ledger.	Accounting and Risk Management Group	Budget and Analysis Group
	ARC	Accounts Receivable Subsystem	General ledger data management system	Administrative finance systems	Subsystem of FACS.	Accounting and Risk Management Group	Budget and Analysis Group
	LOC	Letter of Credit Subsystem	General ledger data management system	Administrative finance systems	Subsystem of FACS.	Accounting and Risk Management Group	Budget and Analysis Group
	NIHXFER	NIH File Transfer Operation	General ledger data management system	Administrative finance systems	Subsystem of FACS.	Accounting and Risk Management Group	Budget and Analysis Group
	TAM	Time and Attendance Management Subsystem	General ledger data management system	Administrative finance systems	Subsystem of FACS.	Accounting and Risk Management Group	Budget and Analysis Group
FARA		Federal Acquisitions Regulation Automated System	Business management information system	Procurement and property management systems	COTS package that assembles contracts. Provides capability to search the FAR HHSAR and FMIR databases. System will generate contract clauses based on selected criteria.	Office of Financial Management	Administrative Programs Systems Staff
FID		Fraud Investigation Database System	Health care finance information system	Payment quality review systems	System that supports fraud investigation tracking. When fraud is discovered by contractors, the information about the fraud case is entered into FID. At that point, CMS (mostly ROs) investigates the alleged fraud and attempts to recover monies owed. If the fraud is of considerable size or the money cannot be recovered, the case may go to the FBI, OIG, or DOJ. This system tracks the entire process of the alleged fraud from the point at which it is entered to the conclusion of the case, whether it be by CMS or by another agency. This system is also able to track the types of fraud occurring (such as over-billing of a certain procedure, or over-billing in a certain regional area) and how often they occur. Supports Kennedy/Kassenbaum.	Program Integrity Group	Budget and Analysis Group
FISS		Florida Standard Part A System	Utilization data management system	Medicare claims processing standard systems	Target single Standard Part A Medicare claims processing system used the most by CMS contractors to process Medicare claims related to medical care provided by hospitals and hospital-based physicians (Part A).	Business Systems Operations Group	Business Systems Operations Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
FOI		Freedom of Information Log	Unknown	Unknown	Freedom of Information Log.	Office of the Dallas Regional Administrator	Office of the Dallas Regional Administrator
FORM2802		Form 2802	Unknown	Unknown	Form 2802.	Office of the Chicago Regional Administrator	Office of the Chicago Regional Administrator
FOSS		Federal Oversight Support Survey	Unknown	Unknown	Federal Oversight Support Survey.	Survey and Certification Group	Finance, Systems and Quality Group
FTAPE		Foreign Tape System	Health care stakeholder information system	Medicare utilization data collection and access systems	Automated system that tracks foreign media shipped from the CMS data center and a means for storing information on data use agreements.	Enterprise Databases Group	Enterprise Databases Group
FULSV2		Federal Upper Limits System V2	Health care services information system	Medicaid and state children's health insurance systems	System that sets the Federal Upper Limits (price) for Medicaid drugs. It takes information electronically from different sources (see data exchanges), compares prices and sets an upper limit for Medicaid drug prices. These upper limit prices are used by pharmacies for Medicaid drug sales. This system also provides information concerning Medicaid drugs for critical publications.	Family and Children's Health Program Group	Finance, Systems and Quality Group
FWADT		Fraud, Waste, and Abuse Detection Tools Database	Unknown	Unknown	Fraud, Waste, and Abuse Detection Tools Database.	Program Integrity Group	Program Integrity Group
GEOHSD		GeoNetworks Health Service Delivery System for MCOs	Health care plan data management system	Managed care systems	System used to assess health service delivery systems of Medicare contracting Managed Care Organizations. Supports evaluation of new MCO applications, service area expansions, and contract monitoring.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
GHP		Group Health Program System	Beneficiary data management system	Managed care systems	Legacy system that accepts input information from several sources, particularly beneficiary enrollment, dis-enrollment, and eligibility information, calculates payments to the Managed Care Plan Organization (MCO) in its business function decision-making component, handles various kinds of print/mail functions, both outputting information to the plans and to the beneficiaries, and causes money to be transferred through the banking system to the plans.	Health Plan Benefits Group	Health Plan Benefits Group
	GROUCH		Beneficiary data management system	Managed care systems	Subsystem of GHP. Monthly GHP reporting subsystem.	Health Plan Benefits Group	Health Plan Benefits Group
	HMUPHMO		Beneficiary data management system	Managed care systems		Health Plan Benefits Group	Health Plan Benefits Group
	MCCOY	Managed Care Online Subsystem	Beneficiary data management system	Managed care systems	Subsystem of GHP.	Health Plan Benefits Group	Health Plan Benefits Group
	MORRIS	Monthly Output Repository Retrieval Information System	Beneficiary data management system	Managed care systems	Subsystem of GHP.	Health Plan Benefits Group	Health Plan Benefits Group
	STADEM		Beneficiary data management system	Managed care systems		Health Plan Benefits Group	Health Plan Benefits Group
GMATS		Grants Management and Tracking System	Business management information system	Procurement and property management systems	System used to process all of the Discretionary Grant awards. Provides the method for reporting CMS's grant activity to the Tracking and Accountability in Government Grants System (TAGGS).	Acquisition and Grants Group	Administrative Programs Systems Staff
GROUCHRO			Beneficiary data management system	Managed care systems	Transaction and reply codes for MCOs using GROUCH data.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
GROUPER		GROUPER	Health care services information system	Medicare pricing systems	System that determines which DRG group each IDC9 code falls into. Used to determine next year's rates in PPS.	Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
GTEMS		GTE Medicare Part B System	Utilization data management system	Medicare claims processing standard systems	Shared Part B Medicare claims processing system maintained by GTE Data Services. This system will be maintained until all Carriers are transitioned to the single Standard Part B processing system—MCS.	Business Systems Operations Group	Business Systems Operations Group
HAVEN		Home Assessment Validation and Entry System	Survey data management system	Health care quality systems	Home Assessment Validation and Entry System.	Information System Group	Finance, Systems and Quality Group
HCBSWTS		Home and Community Based Services Waiver Tracking System	Health care plan data management system	Medicaid and state children's health insurance systems	CMS status report of state Home and Community Based Waivers programs. The report addresses state requests for an initial waiver as well as renewals and has the following data fields: state name, assigned waiver number, description of services, status, effective date, lead CMS contact. It is used by CMS, primarily CMSO, to track the status of the Medicaid Program's Home and Community Based Waiver Program.	Disabled and Elderly Health Program Group	Disabled and Elderly Health Program Group
HCIS		Health Care Information System	Health care services information system	Medicare utilization data collection and access systems	System that allows users to sift through summarized Medicare information, in predetermined views, and focus analysis on areas of suspected fraud and abuse in the Medicare program. Subject areas available for analysis include: Home Health Agency, Skilled Nursing Facility, Hospice, Inpatient, Outpatient, Clinical Lab, and Durable Medical Equipment data.	Program Integrity Group	Enterprise Databases Group
	HCIS	CMS Customer Information System	Health care services information system	Medicare utilization data collection and access systems		Program Integrity Group	Enterprise Databases Group
	ORT	Operation Restore Trust	Health care services information system	Medicare utilization data collection and access systems		Program Integrity Group	Enterprise Databases Group
HCMS		CMS Change Management System	Unknown	Unknown	In development. System that will support collection of information about programmatic changes in a central location, which will allow CMS management to identify conflicts, duplication, and errors.	Program Integrity Group	Program Integrity Group
HCPCS		CMS Common Procedure Coding System	Health care services information system	Medicare pricing systems	System that contains all procedure codes used to bill physician and supplier services for Medicare.	Purchasing Policy Group	Demonstration and Data Analysis Group
HCRIS		Health Care Provider Cost Report Information System	Provider data management system	Medicare financial management and payment systems	System that tracks the initial receipt and subsequent processing of all Medicare (Part A) hospital, independent end-stage renal disease facility and skilled nursing facility cost reports; and generates routine and user specific reports.	Enterprise Databases Group	Enterprise Databases Group
	HHCRIS	Home Health Agency Cost Report Information Subsystem	Provider data management system	Medicare financial management and payment systems	Subsystem of HCRIS	Enterprise Databases Group	Enterprise Databases Group
	IRDIS	Independent Renal Dialysis Information Subsystem	Provider data management system	Medicare financial management and payment systems	Subsystem of HCRIS.	Enterprise Databases Group	Enterprise Databases Group
	SNCRIS	Skilled Nursing Facility Cost Report Information Subsystem	Provider data management system	Medicare financial management and payment systems	Subsystem of HCRIS.	Enterprise Databases Group	Enterprise Databases Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
HEIRS		CMS Employee Information Resource System	Human resources information system	Human resource management system	Collection of systems supporting management of all personnel functions within CMS.	Human Resources Management Group	Administrative Programs Systems Staff
	ATS	Awards Tracking Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
	CPQS	Classified Position Query Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
	EMF	Employee Master File Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
	EPHIST	Employee Position History Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
	NOA	Administrative and NOA Titles Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
	SARS	Suspense Action Reporting Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
	SEPEM	Separated Employee Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
	TMIS	Training Management Information Subsystem	Human resources information system	Human resource management system	Subsystem of HEIRS.	Human Resources Management Group	Administrative Programs Systems Staff
HFR		Local Medicare Events (Health Fair Database)	Business management information system	Customer service systems	Interactive Internet database that provides customers (beneficiaries) with information pertaining to Medicare-related health events and fairs going on throughout the country. Users can search by state and find local events.	Beneficiary Information Services Group	Beneficiary Information Services Group
HHAOASIS		Home Health Agency Outcome and Assessment Information System also known as OASIS	Survey data management system	Health care quality system	System that supports Medicare's partnership with the home care industry to foster and monitor improved home health care outcomes and is proposed to be an integral part of the revised Conditions of Participation for Medicare-certified home health agencies (HHAs).	Survey and Certification Group	Finance, Systems and Quality Group
HIGHLIGHTS		Highlights System	Business management information system	Human resource management system	System that supports communication of CMS organization significant activities.	Operations Support Group	Technology Support Group
HISKEW		Health Insurance Skeleton Write-off System	Health care stakeholder information system	Medicare beneficiary enrollment systems	System that reports on a subset of enrollment information for all active Medicare beneficiaries; used for statistical purposes.	Business Systems Operations Group	Business Systems Operations Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
HITDB		HCFA IT Investment Database	Business management information system	IT management systems	System that collects basic information about all of CMS's IT projects; such as the project description, the responsible component(s), the CMS mission the project supports, the anticipated lifecycle costs, the acquisition strategy, the benefits, the risks, and the technical assumptions. It also tracks more specific information based on the current fiscal year, such as the approved budget, the major milestones, the acquisition schedule, and the actual expenditures.	Investment Planning and Management Group	Investment Planning and Management Group
HITS		CMS ID Tracking System	Human resources information systems	IT management system	System that contains the master list of authorized HDC users.	Technology Infrastructure Group	Technology Infrastructure Group
HOPS		CMS On-line Property System	Business management information system	Procurement and property management systems	System that serves as an inventory and control system which tracks capitalized (cost $25,000 or greater), accountable (cost between $5,000 and $24,999), and sensitive (cost less than $5000) in-house and contractor property. This majority of the inventory is composed of ADP/mainframe hardware and software, FAX equipment, copiers, Fitness Center equipment, and CMS's telephone system. HOPS tracks and reports on usage, depreciation, and disposal of this equipment.	Administrative Services Group	Administrative Programs Systems Staff
HPBSS		United Health Care Part B Shared System	Utilization data management system	Medicare claims processing standard systems	Shared Part B Medicare claims processing feeder system that CMS contractors use to process Medicare claims related to physician care. It is being used by six contractors at seven locations, with its consolidated input being processed at one data center. HPBSS has both a claims and payment processing Subsystem and a financial management Subsystem. The claims and payment processing Subsystem adjudicates claims, suspends claims, and holds claims on the floor awaiting payment. In addition, the Subsystem interfaces with the Common Working File (CWF) for claim information validation and produces claims management reports. The financial Subsystem processes claims-related transactions and generates interim financial reports that are used to compile reports required by the Chief Financial Officer (CFO) Act of 1990. This system will be maintained until all carriers are transitioned to the single Standard Part B processing system—MCS.	Business Systems Operations Group	Business Systems Operations Group
HPMS		Health Plan Management System	Health care plan data management system	Managed care systems	System that supports the BBA-mandated data collection requirements. In addition, the HPMS plan-level data repository will be utilized in the analysis of plan-level quality of care, benefit package, and financial management data analysis and compliance monitoring.	Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
	CROME	Central/Regional Office Monitoring and Evaluation System	Health care plan data management system	Managed care systems	Subsystem of HPMS.	Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
	PBP	Plan Benefit Package Module	Health care plan data management system	Managed care systems	Subsystem of HPMS.	Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
	SB	Summary of Benefits Module	Health care plan data management system	Managed care systems	Subsystem of HPMS.	Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
HRMS		Human Resource Manager System	Human resources information systems	Human resource management system	System that provides intra-management guidance in accordance with 5 U.S.C., Section 7114 for non-bargaining unit employees.	Human Resources Management Group	Human Resources Management Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
HSSS		HSQ Survey Scheduling System	Survey data management systems	Health care quality systems	System that tracks the 5% sample of federal nursing home site visits.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
HTS		CMS Travel System	Human resources information systems	Human resource management systems	System that supports the automated travel management system. It is used to create travel documents, such as travel orders and travel vouchers. It is also used to forward these documents to the appropriate approvers and to interface with the Financial Accounting Control System to automatically reimburse travelers for their valid trip expenses.	Accounting and Risk Management Group	Budget and Analysis Group
IBNR		Incurred But Not Reimbursed Liability	Health care services information system	Medicare utilization data collection and access systems	Incurred But Not Reimbursed Liability.	Enterprise Databases Group	Enterprise Databases Group
ICRDB		Information Collection Requirement Data Base	Unknown	Unknown	In development. Internal Tracking System Paperwork Reduction Act information pertaining to CMS's information collection effort. (Tracking of dates that Federal Register Notices are published along with OMB expiration dates.)	Center for Medicare Management	
IDE		Investigational Device Exemption System	Health care services information system	Medicare utilization data collection and access systems	FDA information used to track certain procedures (investigational devices, ex: hip replacement surgeries) to see if the number performed matches the number forecast. This information is transferred to CMS for distribution to carriers and FIs.	Coverage and Analysis Group	Demonstration and Data Analysis Group
IRIS		Interns and Residents Information System	Provider data management system	Provider enrollment systems	System used to collect and maintain intern and resident (IR) data files from each teaching hospital on a flow basis along with Medicare cost reports. The system produces reports of duplicate full-time equivalent (FTE) IRs for indirect medical education (IME) and direct graduate medical education (GME). The reports provide contractors with information to ensure that hospitals are properly reimbursed for IME and GME, and help eliminate duplicate reporting of IR counts that inflate payments.	Financial Services Group	Budget and Analysis Group
IRP		Incentive Reward Program	Unknown	Unknown	Incentive Reward Program.	Program Integrity Group	Program Integrity Group
IRPTrack		IRP Tracking System	Unknown	Unknown	IRP Tracking System.	Financial Services Group	Enterprise Databases Group
ISYS		ISYS	Document/collaboration information system	IT management systems	COTS product that supports information retrieval and management.	Finance, Systems and Quality Group	
LABREL		Labor Relations System	Unknown	Human resource management systems	In development. Labor Relations System.	Unknown	
LERT		Labor and Employee Relations Reporting System	Human resources information systems	Human resource management system	In development. Labor and Employee Relations Reporting System.	Human Resources Management Group	Human Resources Management Group
LSC		Life Safety Code Tracking System	Unknown	Unknown	Life Safety Code Tracking System.	Office of the Chicago Regional Administrator	Office of the Chicago Regional Administrator
LTC		Long Term Care Tracking	Health care assessment information system	Health care quality systems	LTC enforcement tracking system for nursing homes.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
MADS		Medicare Actuarial Data System	Health care services information system	Medicare utilization data collection and access systems	System that sets Part A deductible and Part B premium rates. Produces a set of tables used by the actuary for setting these rates. Currently, MADS has 2 aspects— institutional and physician supplier. This system is undergoing modernization.	Division of Medicare and Medicaid Cost Estimates	Investment Planning and Management Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
MANRLINE		Menu-Driven Access to the 100% Near-Line Claims File System	Health care services information system	Medicare utilization data collection and access systems	System that provides for data extraction from the 100% Medicare claims data from the Nearline National Claims History files (service years 1991 to present).	Enterprise Databases Group	Enterprise Databases Group
MAT		GHI Data Match	Beneficiary data management system	Medicare beneficiary enrollment systems	System that supports CMS-IRS Data Match operation.	Benefits Operations Group	Benefits Operations Group
MBD		Medicare Beneficiary Database	Beneficiary data management system	Medicare beneficiary enrollment systems	In development. System that will support maintenance of the subset of Medicare data that document both the insurance choices made by Medicare beneficiaries and demographic information about the beneficiaries themselves.	Benefits Operations Group	Enterprise Databases Group
MBES		Medicaid Budget and Expenditure System	Health care finance information system	Medicaid and state children's health insurance systems	System that supports automated data entry, review and validation used by states to enter the budget and expenditure form data online. Budget requests for government allowances are entered on the HCFA-37 form (budget); expenditures are reported on the HCFA-64 and State Child Health Insurance budget and expenditures are reported on the HCFA-21. Provides a consolidated budget and expenditure database that is used to monitor the advancement of funds to the state and the reimbursement of state agencies to ensure that the correct federal share of Medicaid payments are made. Included is the assessment and evaluation of the impact of funds, expenditures in federal regulations and analysis and reporting of results.	Finance, Systems and Quality Group	
MBPRP		Monthly Bill and Payment Records Processing System	Health care services information system	Medicare utilization data collection and access systems	System that processes the MQA 100% Intermediary claims and 100% Payment record files on a monthly basis. Creates a collection of output files for down-line analytical processing.	Enterprise Databases Group	Enterprise Databases Group
MCBS		Medicare Current Beneficiary Survey	Survey data management system	Medicare utilization data collection and access systems	Continuous, multi-purpose survey of a representative sample of the Medicare population, conducted by the CMS's Office of Strategic Planning, through a contract with Westat, Inc.	Information and Methods Group	Information and Methods Group
MCC		Medicare Health Plan Compare also known as MHPC	Health care plan data management system	Customer service systems	Interactive Internet database that provides customers (beneficiaries) with information pertaining to their cost/benefits and quality information about their health plan. This system is located on the IBM servers on the medicare.gov website.	Beneficiary Information Services Group	Beneficiary Information Services Group
MCIS		Managed Care Information System	Health care plan data management system	Managed care systems	System that tracks the MCO's plan information, service areas and marketing material.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
MCS		EDS Medicare Claims System	Utilization data management system	Medicare claims processing standard systems	Target single Standard Part B Medicare claims processing system used the most by CMS contractors to process Medicare claims related to physician care (Part B).	Business Systems Operations Group	Business Systems Operations Group
MCSC		Medicare Customer Service Center	Health care stakeholder information system	Customer service systems	Trail blazer customer service pilot (traffic cop) access to OIS data systems. Supports a single 800 number implementation via the networked infrastructure to enable one-stop customer service capability through the Medicare Customer Service Center (MCSC) and Medicare Helpline desktop tools.	Beneficiary Information Services Group	Beneficiary Information Services Group
MDDM		Medicaid Data Mart	Health care services information system	Medicaid and state children's health insurance systems	In development. Medicaid Data Mart.	Enterprise Databases Group	

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
MDM		Medicare Claims Data Mart	Health care services information system	Medicare utilization data collection and access systems	In development. Medicare Claims Data Mart.	Enterprise Databases Group	Enterprise Databases Group
MDRI		Medicaid Drug Rebate Initiative System	Health care services information system	Medicaid and state children's health insurance systems	System that supports monitoring of the Medicaid Drug Rebate Initiative. Calculates rebates due from drug manufacturers to states for drug purchases through Medicaid. Gathers drug pricing information, and state utilization information on drugs used per quarter.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
MDS		Minimum Data Set (Long-term Care/Skilled Nursing Facility)	Survey data management system	Payment quality review systems	System that supports assessment of long-term care residents in SNFs and NFs.	Survey and Certification Group	Finance, Systems and Quality Group
MED		Medicare Exclusion Database	Provider data management system	Provider enrollment systems	System that supports the Medicare Claims Processing Contractors' ability to ensure that no payments are made for any service (other than an emergency item or service) furnished by an individual or entity during the period while they are excluded from participation in Medicare.	Program Integrity Group	Budget and Analysis Group
MEDPAR		Medicare Provider Analysis and Review System	Health care services information system	Medicare utilization data collection and access systems	System that provides Medicare utilization data for 100 percent of Medicare beneficiaries with claims from an inpatient hospital or skilled nursing facility (SNF). It merges all Medicare bills for a beneficiary stay in an inpatient hospital or SNF to present a complete view for analysis of institutional Part A utilization.	Enterprise Databases Group	Enterprise Databases Group
MEDPOL		Medicaid Policy Index	Unknown	Unknown	Medicaid Policy Index.	Office of the Dallas Regional Administrator	Family and Children's Health Program Group
MEDQUEST		MEDQUEST Clinical Data Collection Design System	Survey data management system	Payment quality review systems	CMS developed tool suite that enables the user to quickly design a collection system (sometimes referred to as a module) and collect data using that system.	Information System Group	Information System Group
MFSR		Medicare Focused Medical Review System	Health care services information system	Payment quality review Subsystems	System used to monitor the success of Focused Medical Review activities of contractors; i.e., FIs, Carriers, and DMERCS'. Collects information on the sources and causes of inappropriate or necessary services billed to Medicare and what the contractor did about those problems.	Program Integrity Group	Budget and Analysis Group
MGC		Medigap Compare	Health care plan data management system	Customer service systems	Interactive Internet database that provides customers (beneficiaries) with information pertaining to Medigap plans across the country.	Beneficiary Information Services Group	Beneficiary Information Services Group
MMCITS		Medicaid Managed Care Information System	Health care stakeholder information system	Medicaid and state children's health insurance systems	System used to collect Medicaid managed care program and enrollment data as of June 30 each year. The collection of this information is used to develop annual reports published by CMS known as "National Summary of State Medicaid Managed Care Programs" and "Medicaid Managed Care Enrollment Report," respectively.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
MMCS		Medicare Managed Care System (redesign)	Beneficiary data management system	Managed care systems	In development. Medicare Managed Care Systems (redesign).	Health Plan Benefits Group	Business Systems Operations Group
MPARTS		Mistaken Payment Recovery Tracking System	Health care finance information system	Payment quality review systems	System that supports the IRS/SSA/HCFA data match efforts to identify situations where another health care plan should be the primary payer of a Medicare beneficiary's health care claims, and to recover mistaken Medicare payments from third party payers.	Financial Services Group	Budget and Analysis Group
MPC		Medicare Plus Choice System	Health care services information system	Medicare pricing systems	System that supports payment to Medicare + Choice plans on a risk adjusted basis.	Division of Medicare and Medicaid Cost Estimates	Division of Medicare and Medicaid Cost Estimates

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
MPD		Medicare Policy Database	Unknown	Unknown	In development. System that will serve as a central repository for all local medical review policies, supporting CMS's Program Integrity staff and Medicare contractors.	Financial Services Group	Budget and Analysis Group
MPES		Medicare Projections and Estimates System	Business management information system	Administrative finance systems	Medicare Projections and Estimates System.	Division of Medicare and Medicaid Cost Estimates	
MPFSM		Medicare Physician Fee Schedule Database Mapping	Health care services information system	Medicare pricing systems	System that maps information about physician office location vis-à-vis appropriate fee schedules; supports creation of physician fee schedule file.	Purchasing Policy Group	Demonstration and Data Analysis Group
MQSA		FDA Mammography Database	Health care services information system	Medicare pricing systems	Mammography (equipment) certification data maintained by the FDA.	Provider Billing and Education Group	Demonstration and Data Analysis Group
MRS		Medical Review System also known as BMR and MRS1	Health care services information system	Payment quality review systems	Interactive data entry and report production facility that collects data on carrier costs, workload and savings for Part B.	Program Integrity Group	Program Integrity Group
MSA		Medicare Savings Account System	Health care finance information systems	Managed care system	System that supports the Medicare+Choice option of beneficiary medical savings account.	Health Plan Benefits Group	Health Plan Benefits Group
MSIS		Medicaid Statistical Information System	Beneficiary data management system	Medicaid and state children's health insurance systems	System that creates the HCFA-2082 (Statistical Report on Medical Care: eligible, recipients, payments and services) for participating states. Collects and maintains detailed data on Medicaid eligible and claims paid for Medicaid covered services. It also maintains personal summary databases for each state.	Demonstration and Data Analysis Group	Enterprise Databases Group
MSPPAY		MSPPAY Part A and Part B Module	Unknown	Unknown	MSPPAY Part A and Part B Module.	Benefits Operations Group	
MVPS		Medicare Volume Performance Reporting System	Business management information system	Medicare utilization data collection and access systems	System used to gather data on volume of physicians services that are used to produce reports used in actuarial trend analysis.	Demonstration and Data Analysis Group	
NCHPR		National Claims History Processing Reports System	Health care services information system	Medicare utilization data collection and access systems	Summary of Medicare reimbursement by type of service based on date of service period. Part A/B, provider, and bill type breakdown.	Accounting and Risk Management Group	Demonstration and Data Analysis Group
NCHSTS		National Claims History Statistical Tabulation System	Health care services information system	Medicare utilization data collection and access systems	System that summarizes and computes Medicare statistical tabulations related to beneficiary utilization. Statistical tabulations are compiled on a quarterly and annual basis. This is data having to do with reimbursements, charges, and length of stay. These tables provide a snapshot of the data with no detail.	Enterprise Databases Group	Enterprise Databases Group
NCHSUM		NCH Summary Process	Health care services information system	Medicare utilization data collection and access systems	Series of programs that take input form the Monthly Bill and Payment Records Processing System and Weekly Front-end Bill and Payment Records Processing System. These programs act as a filtering mechanism to create subsets of Part A and Part B bills.	Enterprise Databases Group	Enterprise Databases Group
NEARLINE		NCH Nearline Update and Maintenance System	Health care services information system	Medicare utilization data collection and access systems	System that updates and maintains Medicare data in the NCH Nearline Repository to be used for statistical monitoring, evaluation, and program planning. NEARLINE creates 1% and 5% samples of the claims information. Weekly files are created and then rolled up into monthly files. Special files are made for systems such as DSAF, MANRLINE, and MEDPAR.	Enterprise Databases Group	Enterprise Databases Group
NETTLVRS		National Emphysema Treatment Trials	Unknown	Unknown	National Emphysema Treatment Trials.	Budget and Analysis Group	

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
NHC		Nursing Home Compare	Provider data management system	Provider data management systems	Interactive Internet database that provides customers (beneficiaries) with information pertaining to Medicare certified Nursing Homes throughout the country. Data-base provides information such as nursing home general information, resident characteristics and information about the nursing home.	Beneficiary Information Services Group	Beneficiary Information Services Group
NMTX		New National Health Expenditures Database	Business management information system	Unknown	Database system that contains the National Health Accounts estimates and other supporting data. Contains time series estimates of the national spending on health by services and source of funds and by state and age.	National Health Statistics Group	National Health Statistics Group
NMUD		National Medicare Utilization Database	Health care services information system	Medicare utilization data collection and access systems	In development. System will support access and analysis of national claims and encounter utilization data.	Enterprise Databases Group	
NPS		National Provider System	Provider data management system	Provider enrollment systems	In development. System that will manage the identification numbers of each provider. Will Assign and tracks provider ID numbers.	Program Integrity Group	Budget and Analysis Group
OEOCR		OEOCR Complaints Tracking System	Unknown	Unknown	In development. OEOCR Complaints Tracking System.	Office of Equal Opportunity and Civil Rights	Security and Standards Group
OIGHTLNE		OIG Hotline System	Unknown	Unknown	OIG Hotline System.	Financial Services Group	Enterprise Databases Group
OLRC		Online Learning Resource Center	Human resources information systems	Human resource management system	Online Learning Resource Center.	Learning Resources Group	
ONREG		On-line Registration System	Human resources information system	Human resource management systems	System that supports viewing information about upcoming in-house courses and interactive course registration.	Learning Resources Group	Learning Resources Group
ORDPROJ		ORDPROJ	Unknown	Unknown	ORDPROJ.	Systems Technical and Analytic Resources Group	Systems Technical and Analytic Resources Group
ORT98		ORT 98 Tracking System	Unknown	Unknown	ORT 98 Tracking System.	Program Integrity Group	Enterprise Databases Group
OSCAR		On-line Survey Certification and Reporting System	Survey data management system	Health care quality systems	System that provides intensive data gathering capabilities during the survey phase of the certification process to identify and characterize participating Medicare and Medicaid health care providers. Includes CLIA, ODIE, FMS and COMP Subsystems.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
	CABS	CLIA Accounting and Billing System	Survey data management system	Health care quality systems	Subsystem of OSCAR. Accounting collections and billing system that produces billings and monitors and controls receipts.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
	CLIA	Clinical Laboratory Improvement Act Subsystem	Survey data management system	Health care quality systems		Finance, Systems and Quality Group	Finance, Systems and Quality Group
	COMP	Complaint System	Survey data management system	Health care quality systems	Subsystem of OSCAR. System used to track complaints made against labs.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
	FMS		Survey data management system	Health care quality systems	Subsystem of OSCAR.	Finance, Systems and Quality Group	Financial Systems and Quality Group
	ODIE	Online Data Input and Edit Subsystem	Survey data management system	Health care quality systems	Subsystem of OSCAR. System used to record and track CLIA laboratory demographic and test specialty data based on the results of CLIA surveys.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
OTIS		Online Telecommunications Information System	Unknown	Unknown	Online Telecommunications Information System.	Technology Infrastructure Group	

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
PAPPS		Provider Profile System	Unknown	Unknown	Provider Profile System.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
PARKING		Parking System	Business management information system	Procurement and property management systems	Provides CMS's facilities management personnel the capabilities to monitor and maintain data related to CMS's assigned parking permits, aiding them in the performance of their daily duties.	Human Resources Management Group	Administrative Programs Systems Staff
PASS		Policy Access Support System	Unknown	Unknown	Policy Access Support System.	Office of the Actuary	
PATS		PRO Abstraction Tracking System	Health care assessment information system	Payment quality review systems	System that supports the responsibilities of the PROs and CDAC regarding tracking of medical records.	Information System Group	Information System Group
PDAP		Prescription Drug Assistance Program	Health care plan data management system	Customer service systems	Interactive Internet database that provides customers (beneficiaries) with information on programs that offer discounts or free medication to individuals in need. Allows customers to search for Medicare managed care plans, and Medigap plans that offer prescription drug coverage in their area.	Beneficiary Information Services Group	Beneficiary Information Services Group
PECOS		Provider Enrollment Chain Ownership System	Provider data management system	Provider enrollment systems	System that serves as a national database of Medicare provider data. Contains information related to ownership, managing employees, billing arrangements, reassignment of benefits, practice locations, and related organizations.	Program Integrity Group	Budget and Analysis Group
PICS		Plan Information Control System	Provider data management system	Managed care systems	Main repository of MCO Plan data that produces management reports for the monitoring and controlling of group health plans. Tracks managed care plans and contracts.	Health Plan Benefits Group	Health Plan Benefits Group
PIMR		Program Integrity Medical Review System	Health care services information system	Medicare financial management and payment systems	Program Integrity Medical Review System.	Program Integrity Group	Budget and Analysis Group
PIXL		Resume Scan Pilot	Unknown	Unknown	In development. Resume Scan Pilot.	Budget and Analysis Group	
PNS		Provider Number System	Unknown	Unknown	Provider Number System (LAN-based).	Office of the San Francisco Regional Administrator	Office of the San Francisco Regional Administrator
POMRS		Regional Office Medical Review System	Unknown	Unknown	Regional Office Medical Review System.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
PORA		Part A Overpayments	Unknown	Unknown	Part A Overpayments.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
PORS		Provider Overpayment Recovery System	Health care finance information system	Provider enrollment systems	System that identifies, monitors, and controls Medicare overpayments to providers and provides a statistical basis for analysis to determine if additional policy guidelines are needed in cost settlement and overpayment-recovery areas (Part A only).	Financial Services Group	Budget and Analysis Group
PPDIR		Participating Physician Directory	Provider data management system	Customer service systems	Interactive Internet database that provides users (beneficiaries) with access to a searchable directory that contains names, addresses, and specialties of Medicare participating physicians who have agreed to accept assignment on all Medicare claims and covered services.	Beneficiary Information Services Group	Beneficiary Information Services Group
PPRMS		Physician Payment Review Monitoring System	Health care finance information system	Payment quality review systems	System that produces national, regional, and carrier level reports of allowed services and charges by various keys for selected code groupings.	Research and Evaluation Group	Systems Technical and Analytic Resources Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
PPS		Prospective Payment System	Health care services information system	Medicare pricing systems	System that sets rate schedules for short-stay hospital reimbursement using diagnosis related groups (DRG). Uses hospital inpatient records and intermediary-supplied provider data to recalibrate annually the DRG weights and individual hospital case mix in the PPS.	Purchasing Policy Group	Demonstration and Data Analysis Group
PPSM		Printing and Paper Stock Management System	Business management information system	Procurement and property management systems	System that tracks and controls the ordering, inventory-ing, warehousing, and distribution of CMS's printed material (e.g., forms, publications).	Administrative Programs Systems Staff	Administrative Programs Systems Staff
PRICER		PPS Pricing Software for Inpatient Stays System	Health care services information system	Medicare pricing systems	System used by fiscal intermediaries to price inpatient hospital stays.	Purchasing Policy Group	Demonstration and Data Analysis Group
	PCPRICER		Unknown	Medicare pricing systems		Purchasing Policy Group	Demonstration and Data Analysis Group
PRISM		Procurement Request Information System also known as PRI and PRIS	Business management information system	Procurement and property management systems	COTS system, designed by DataFlex that generates contract and purchase order forms. Tracks all purchas-ing activities and produces reports or statistics.	Acquisition and Grants Group	Administrative Programs Systems Staff
PROFILES		MCR Contractor Profile System	Unknown	Unknown	MCR Contractor Profile System.	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
PROTRAC		PROTRAC	Unknown	Unknown	PROTRAC.	Southern Consortium Contractor Management Staff	Southern Consortium Contractor Management Staff
PS&R		Provider Statistical and Reimbursement System	Health care finance information system	Medicare financial management and payment systems	Software developed at CMS and installed in each fiscal intermediary shop. This system transforms claims proc-essing system's data to a form that is suitable for cost report systems. Accumulate data between claims and cost functions. All data processing is performed at the FI sites.	Financial Services Group	Budget and Analysis Group
PSOR		Physician and Supplier Overpayment Recovery System	Health care finance information system	Provider enrollment systems	System that prepares statistical reports that enable management of physician and supplier overpayment recoveries. This system identifies, monitors, and re-solves Medicare Part B provider overpayments.	Financial Services Group	Budget and Analysis Group
PSOR97		Provider Overpayment System (Part B)	Unknown	Unknown	Provider Overpayment System (Part B).	Office of the Atlanta Regional Administrator	Office of the Atlanta Regional Administrator
PSPRICE		Physician Fee Schedule System	Health care services information system	Medicare pricing systems	System that maintains, updates, and disseminates Part B pricing data for services priced under physician schedules.	Purchasing Policy Group	Demonstration and Data Analysis Group
	PUP		Health care services information system	Medicare pricing systems		Purchasing Policy Group	Demonstration and Data Analysis Group
PUBS		Publication Ordering System	Document/collaboration information system	Customer service systems	Interactive Internet database that allows customers (beneficiaries) to view, order, or download Medicare publications. (Medicare.Gov)	Beneficiary Information Services Group	Beneficiary Information Services Group
PULSE		Medicare Contractor Process Counts Monitoring	Health care services information system	Medicare financial management and payment systems	System that supports timely identification of variances and monitoring performance in Medicare's contractor operated Fee-for-Service claims processing systems.	Medicare Contractor Management Group	Systems Quality Group
	PC		Unknown	Medicare financial management and payment systems		Medicare Contractor Management Group	Systems Quality Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
QIES		Quality Improvement and Evaluation Systems	Survey data management systems	Health care quality system	In development. System that will support collection of provider and beneficiary-specific outcomes of care and performance data across a multitude of delivery sites for use in improving the quality and cost of services provided by the Medicare and Medicaid programs. QIES will consist of data bases housed in the states and at CMS with direct access for Peer Review Organizations through the SDPS WAN.	Information System Group	Finance, Systems and Quality Group
RAFACT		Risk Adjustment Factor	Unknown	Unknown	Risk Adjustment Factor.	Demonstration and Data Analysis Group	Demonstration and Data Analysis Group
RAVEN		Resident Assessment Validation and Entry System	Survey data management system	Health care quality systems	System that supports nursing home facilities in collecting and sending Minimum Data Set (MDS) data to state agencies. Based on the MEDQUEST tool, this system enables the user to electronically enter resident assessment data into MDS standard record formats, calculate Resource Utilization Groups (RUGs), and export the resident assessment data records to the state.	Finance, Systems and Quality Group	Finance, Systems and Quality Group
RBS		Report on Benefit Savings System	Health care finance information system	Payment quality review systems	Collection point for Medical Review Part A data. Reports on money saved by Medical Review. Ties into ad hoc CFO reports to OMB.	Program Integrity Group	Program Integrity Group
RDW		Regional Data Warehouse	Unknown	Unknown	Regional Data Warehouse.	Office of the Kansas City Regional Administrator	Office of the Kansas City Regional Administrator
REBUS		Renal Beneficiary and Utilization System	ESRD data management system	End-stage renal disease systems	System that contains demographic, medical, payment, and entitlement data on Medicare beneficiaries with End Stage Renal Disease (ESRD); certification and other information for Medicare-approved ESRD providers; and aggregate ESRD patient population information.	Information System Group	Information System Group
RECON		Reconsideration System	Beneficiary data management system	Managed care systems	System that tracks reconsiderations and appeals for beneficiaries enrolled in group health plans.	Health Plan Benefits Group	Health Plan Benefits Group
REMAS		MSP Recovery Management and Accounting System	Health care finance information system	Payment quality review systems	In development. System will support the management of all aspects of the Medicare Secondary Payer (MSP) recovery case development and execution.	Financial Services Group	Budget and Analysis Group
REMIS		Renal Management Information System	ESRD data management system	End-stage renal disease systems	In development. Renal Management Information System.	Information System Group	Information System Group
RGSTRY		Reassignment Registry	Human resources information systems	Human resource management system	System that serves as a mechanism for employees to express an interest in a change of assignment and to identify other employees with similar backgrounds who have also expressed an interest in a change.	Human Resources Management Group	Human Resources Management Group
RMS		Record Management System	Business management information system	Procurement and property management systems	System that tracks the physical location of hardcopy materials in the warehouse. Each component has a separate area in the warehouse which houses any paper copies such as SF 171's, program files, and other personnel records. The system also has the capability of letting the warehouse person know when a particular file can be destroyed because it has been held for the required amount of time. A sign in and sign out log is also available.	Administrative Services Group	Administrative Programs Systems Staff
ROINVENT		RO Inventory	Unknown	Unknown	RO Inventory.	Office of the Chicago Regional Administrator	Office of the Chicago Regional Administrator

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
ROTRAVEL		RO Travel Database	Unknown	Unknown	RO Travel Database.	Office of the Chicago Regional Administrator	Office of the Chicago Regional Administrator
RRS		Rapid Reporting System	Unknown	Unknown	In development. Rapid Reporting System.	Partnership and Promotion Group	
RTS		Regulations Tracking System	Unknown	Unknown	Regulations Tracking System.	Operations Support Group	Operations Support Group
SDPS		Standard Data Processing System	Survey data management systems	Health care quality system	Data system distributed over a Wide Area Network (WAN) in a client server environment, containing all the data and software a Peer Review Organization (PRO) needs to fulfill their contractual requirements with CMS. The PROs are required to initiate quality improvement projects and analyze data to improve processes or quality of care. Each PRO maintains their own data-base and ADP staff to support the database and other support functions. SDPS provides the standardization that is necessary to promote improved health care status of beneficiaries and create excellence in the design and administration of CMS programs. SDPS facilitates the timely provision of Medicare claims data for sophisticated data analysis and the development of local and national quality improvement projects for widespread implementation and impact on the Medi-care population.	Information System Group	Information System Group
SGR		Risk Adjustment Factor	Unknown	Unknown	In development. Risk Adjustment Factor.	Office of the Actuary	Demonstration and Data Analysis Group
SIMS		ESRD Standard Information Management System also known as ESRD SIMS	ESRD data management system	End-stage renal disease systems	System that supports the business activities of the End Stage Renal Disease Networks (ESRD), including ESRD Network file transmission and reporting require-ments of ESRD data to CMS. Replaced the EDEES system.	Information System Group	Information System Group
SITEMAN		Site Management System	Unknown	Unknown	Site Management System.	Technology Infrastructure Group	Technology Infrastructure Group
SMRF		State Medicaid Research Files System	Health care services information system	Medicaid and state children's health insurance systems	States submit files of Medicaid eligible and records about claims paid for Medicaid-covered services to the MSIS system for validation of the data. The SMRF sys-tem sorts that valid data by the date of payment, ap-plies adjustments, and creates output files.	Research and Evaluation Group	Enterprise Databases Group
SNFPRICER		Skilled Nursing Facility Pricer	Health care services information system	Medicare pricing systems	System that supports per diem prospective payments for skilled nursing facilities (SNFs) covering all costs (routine, ancillary and capital) related to the services furnished to beneficiaries under Part A of the Medicare program.	Purchasing Policy Group	Demonstration and Data Analysis Group
SPACE		SMI Premium Accounting, Collection, and Enrollment System	General ledger data management system	Medicare beneficiary enrollment systems	System that bills and collects Medicare premiums from third parties who pay premiums on behalf of beneficiar-ies. Updates beneficiary information such as state buy-in or other third party collectors. Bills states, private groups, OPM (government retirees).	Benefits Operations Group	Business Systems Operations Group
SPL		Sampling.xls	Unknown	Unknown	Sampling.xls.	Health Plan Policy Group	Health Plan Benefits Group
SRMS		Statistical Report (CMS-2082) on Medicaid Services System	Health care services information system	Medicaid and state children's health insurance systems	System used to collect, manage, analyze, and dis-seminate summary information on eligible, recipients, and payment for services covered by state Medicaid programs.	Finance, Systems and Quality Group	Finance, Systems and Quality Group

Table 5–2. Application Inventory (Continued)

Application name	Alias	Definition	Information system group	System family	Description	Owner	Maintainer
SSPAF		SNF Short Period Adjustment Factor	Unknown	Unknown	System that creates an adjustment factor for paying SNFs with a short fiscal period.	Chronic Care Policy Group	Chronic Care Policy Group
STAR		System Tracking Audit and Reimbursement	Health care finance information system	Medicare financial management and payment systems	CMS-owned system maintained by Mutual of Omaha; used by fiscal intermediaries for tracking the receipt and subsequent actions taken on all provider cost reports.	Financial Services Group	Financial Services Group
STPW		State Plan for Windows	Unknown	Unknown	State Plan for Windows.	Office of the Dallas Regional Administrator	Office of the Dallas Regional Administrator
STS		Suggestion Tracking System	Unknown	Unknown	Suggestion Tracking System.	Administrative Programs Systems Staff	Administrative Programs Systems Staff
SYSTEMS		CMS Data Center Custom System Routines	Unknown	Unknown	Compilation of all HDC custom routines used by applications programmers or analysts. It includes some COTS software.	Technology Infrastructure Group	Technology Infrastructure Group
TAIMS		Time and Attendance Information Management System	Human resources information systems	Human resource management systems	COTS system that allows timekeepers to collect time and attendance information for CMS employees and upload the data to the mainframe.	Accounting and Risk Management Group	Budget and Analysis Group
TRM		IT Standards Profile Database	Business management information system	IT management systems	System that supports the storage and communication of technology standards and preferred products. Organized by CMS's Technical Reference Model (TRM).	Office of Information Services (Information Technology Architecture Staff)	Office of Information Services (Information Technology Architecture Staff)
UPIN		Unique Physician Identification Number System	Provider data management system	Provider enrollment systems	A database of physician UPIN (Unique Physician Identification Number) and associated practice settings; used for ad-hoc studies and UPIN validation. A UPIN uniquely identifies a physician across all practice settings (offices).	Program Integrity Group	Demonstration and Data Analysis Group
VLTS		Voluntary Leave Transfer System	Human resources information system	Human resource management systems	System that allows an employee to donate excess annual leave hours to personnel who need to take extended leave due to medical reasons, but who do not have sufficient hours accrued to cover their absence.	Human Resources Management Group	Administrative Programs Systems Staff
VMS		VIPS Medicare System	Utilization data management system	Medicare claims processing standard systems	System that processes Medicare Durable Medical Equipment claims (DMERC).	Business Systems Operations Group	Business Systems Operations Group
WFPS		Work Force Planning System	Unknown	Human resource management systems	In development.	Learning Resources Group	
WI		Wage Index System	Health care services information system	Medicare pricing systems	System that produces wage indices by urban and rural metropolitan statistical areas (MSAs) for non-federal short-term acute-care hospitals under the prospective payment system (PPS) and short-term acute-care hospitals in waiver states using wage data obtained from HCRIS. The wage index is defined as the ratio of the average hourly wage for a MSA to the national average hourly wage and is used to develop prospective payment rates and payments under the prospective payment system.	Purchasing Policy Group	Demonstration and Data Analysis Group
WTS		Waiver Tracking System	Health care plan data management system	Medicaid and state children's health insurance systems	System that is used as an internal management tool to track the status of 1915(b) waivers—Medicaid Managed Care. The system allows the waiver team the ability to better manage the waiver workload by tracking waivers from the day they submitted through the final decision.	Finance, Systems and Quality Group	Finance, Systems and Quality Group

FUNCTIONS SUPPORTED BY APPLICATIONS

An understanding of which applications support which business functions is important for determining whether current applications are meeting the needs of the stakeholders, for identifying redundancy in functionality, and for identifying missing functionality.

The number of applications supporting each CMS functional area and function is as follows (the number does not equal 231 because several applications support multiple functions and vice versa):

1. Manage CMS administrative processes	1
2. Develop programs	20
3. Manage program operations	57
4. Manage Medicare finances	28
5. Manage program integrity operations	31
6. Administer Medicaid and SCHIP	6
7. Manage CMS relationships	1
8. Provide administrative services	38
9. Manage outreach and education	12
10. Manage or participate in health industry standard development	0
11. Manage program quality	16

Table 5-3 shows which applications support which CMS business functional areas and functions.[1] The table is organized by each functional area, with only those applications listed that supported functions within each functional area. In addition, aliases are not included in this table.

RELATIONSHIP OF SUBJECT AREAS TO APPLICATIONS

Table 5-4 shows the relationships between CMS subject areas introduced in Chapter 4 and business application systems. The first column lists the subject areas and the first row lists the applications. An "X" in the cell indicates that the corresponding application uses data in the corresponding subject area.

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[1] The relationships in this matrix are from the ESID database.

Table 5–3. Applications Supporting Business Functions

Applications	1. Manage CMS administrative processes	1.1 Manage strategic planning	1.2 Provide organizational management	1.3 Assess programs	1.3.1 Evaluate effectiveness of CMS programs	1.3.2 Develop and implement a management improvement strategy	1.3.3 Develop a CMS surveillance strategy	1.4 Manage investments
HITDB	X							X

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	2. Develop programs	2.1 Manage partner relationship policy development	2.1.1 Develop policies for contracts, grants, and agreements	2.2 Provide actuarial services	2.3 Manage Medicare beneficiary enrollment policy development	2.3.1 Develop policy for Medicare beneficiary enrollment in Managed Care	2.3.2 Develop MCO payment policy	2.4 Manage Medicaid/SCHIP beneficiary eligibility policy development	2.5 Manage payment policy development	2.6 Manage coverage policy development	2.7 Manage program data and statistics	2.7.1 Identify quality of care indicators for the PRO program	2.8 Manage research and evaluation	2.9 Manage demonstration projects	2.9.1 Perform PRO special study activities	2.10 Manage legislative activities and regulation development	2.11 Manage Medicare claims appeals, grievances and complaints policy development	2.12 Manage quality of care/utilization review policy development	2.12.1 Develop policies for mandatory case review performed by Peer	2.12.2 Develop policy for beneficiary rights outreach and educational	2.13 Manage program integrity policy development	2.13.1 Coordinate Medicare Managed Care Organization program integrity policy	2.13.2 Guide Medicaid/SCHIP program integrity policy for States	2.14 Manage policy development for participation of providers
AAPCC	X			X																				
CWF	X																	X						
DB	X				X																			
DPS	X								X						X									
EDBS	X			X	X													X						
GHP	X				X													X			X			X
HISKEW	X				X																			
MADS	X	X																						
MCBS	X	X			X																			
MDDM	X							X																
MDM	X							X																
MMCITS	X							X																
MPES	X	X																						
MVPS	X	X																						
NEARLINE	X	X																						
NMTX	X	X																						
NMUD	X	X																						
PS&R	X	X																						
REBUS	X				X																			
SPACE	X				X																			

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	3. Manage program operations	3.1 Maintain Medicare beneficiary enrollment	3.1.1 Enroll beneficiaries in MCOs and demonstrations	3.1.2 Disenroll beneficiaries in MCOs and demonstrations	3.2 Manage Medicaid and SCHIP entitlement/eligibility and maintenance	3.3 Manage provider enrollment	3.4 Determine managed care organizations eligibility	3.4.1 Process managed care organization applications	3.4.2 Review Adjusted Community Rating (ACR) proposals	3.4.3 Qualify and administer managed care organization contracts	3.5 Manage Medicare contractors	3.5.1 Evaluate contractor performance	3.6 Manage peer review and ESRD network contractors	3.6.1 Award and maintain contracts with PROs	3.6.2 Monitor and evaluate PRO performance	3.6.3 Serve as technical advisor to support PROs	3.6.4 Monitor mandatory case review activities performed by PROs	3.6.5 Monitor PRO activities relative to beneficiary rights outreach and	3.6.6 Monitor PRO activities relative to the payment error prevention program	3.7 Process Medicare claims	3.8 Manage claims pricing	3.9 Oversee State health insurance	3.10 Coordinate benefits	3.11 Process Medicare appeals, grievances, and complaints	3.11.1 Process appeals of managed care organization claims	3.11.2 Hear provider protests
ALJTrack	X										X															
APASS	X																			X						
APPS	X						X																			
ASCPRICER	X																			X	X					
CASE-T	X										X															
CLFS	X																			X	X					
CMHS	X										X															
CMIS	X										X															
CPE	X										X															
CROWD	X										X															
CWF	X	X																		X						
CWFMQA	X						X																			
DB	X	X																								
DMEFS	X																			X	X					
DNMNTR	X	X																								
EDBS	X	X																								
EMCSES	X																			X						
FACS	X																			X						
FISS	X																			X						
GEOHSD	X						X																			
GHP	X	X					X																			
GROUCHRO	X	X																								
GROUPER	X																				X					
GTEMS	X																			X						
HPBSS	X																			X						
HPMS	X						X																			
IDE	X																					X				
MBD	X	X																								
MCIS	X						X																			
MCS	X																			X						
MDM	X																					X				
MED	X																			X						
MMCS	X	X																								
MPFSM	X																				X					
MQSA	X																				X					
MRS	X										X															

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	3. Manage program operations	3.1 Maintain Medicare beneficiary enrollment	3.1.1 Enroll beneficiaries in MCOs and demonstrations	3.1.2 Disenroll beneficiaries in MCOs and demonstrations	3.2 Manage Medicaid and SCHIP entitlement/eligibility and maintenance	3.3 Manage provider enrollment	3.4 Determine managed care organizations eligibility	3.4.1 Process managed care organization applications	3.4.2 Review Adjusted Community Rating (ACR) proposals	3.4.3 Qualify and administer managed care organization contracts	3.5 Manage Medicare contractors	3.5.1 Evaluate contractor performance	3.6 Manage peer review and ESRD network contractors	3.6.1 Award and maintain contracts with PROs	3.6.2 Monitor and evaluate PRO performance	3.6.3 Serve as technical advisor to support PROs	3.6.4 Monitor mandatory case review activities performed by PROs	3.6.5 Monitor PRO activities relative to beneficiary rights outreach and	3.6.6 Monitor PRO activities relative to the payment error prevention program	3.7 Process Medicare claims	3.8 Manage claims pricing	3.9 Oversee State health insurance	3.10 Coordinate benefits	3.11 Process Medicare appeals, grievances, and complaints	3.11.1 Process appeals of managed care organization claims	3.11.2 Hear provider protests
MSIS	X				X																					
NEARLINE	X						X																			
NPS	X					X																				
PECOS	X					X																				
PICS	X						X																			
PPS	X																				X					
PRICER	X																				X					
PSPRICE	X																				X					
PULSE	X										X															
REBUS	X	X																								
RECON	X																								X	
REMIS	X	X												X												
SIMS	X													X												
SMRF	X					X																				
SNFPRICER	X																				X					
SPACE	X	X																								
SRMS	X				X																		X			
UPIN	X					X																				
VMS	X																			X						
WI	X																			X	X					
WTS	X																					X				

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	4. Manage Medicare finances	4.1 Monitor contractor administrative budget and costs	4.1.1 Fund PRO program and special studies	4.1.2 Prepare and maintain the PRO procurement plan	4.1.3 Request apportionment for the PRO program	4.2 Manage premium collection	4.3 Manage benefit payment accounting	4.4 Manage Medicare contractor banking	4.5 Manage provider financial management	4.6 Manage provider costreports	4.7 Manage MCO payment and fee collection	4.7.1 Pay MCOs	4.7.2 Calculate Medicare beneficiary risk adjusters for MCOs	4.8 Manage debt collection accounting
AAPCC	X										X			
ADR	X									X				
APPS	X										X			
CAFM	X	X					X							
CAFMII	X	X												
CASR	X	X												
CWF	X									X				
CWFMQA	X									X				
DB	X					X								
DCS	X													X
FACS	X						X				X			
GHP	X										X			
HCPCS	X									X				
HCRIS	X										X			
IRIS	X										X			
MEDPAR	X									X				
MMCS	X										X			
MPARTS	X									X				
MPC	X										X			
MSA	X										X			
NEARLINE	X									X				
PICS	X										X			
PORA	X									X				
PORS	X									X				
PSOR	X									X				
PS&R	X										X			
SPACE	X					X								
STAR	X										X			

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	5. Manage program integrity operations	5.1 Review post payment	5.2 Monitor utilization	5.3 Conduct medical review	5.4 Manage fraud, waste, and abuse	5.5 Conduct Medicare secondary payer review	5.6 Monitor compliance	5.6.1 Monitor MCO compliance
APASS	X					X		
APS	X		X					
BESS	X		X					
CMPTS	X				X			
CWF	X					X		
DPPS	X	X				X		
FID	X				X			
FISS	X					X		
GHP	X					X		
GTEMS	X					X		
HCIS	X				X			
HPBSS	X					X		
HPMS	X						X	
IBNR	X	X						
MAT	X					X		
MBPRP	X		X					
MCS	X					X		
MEDPAR	X		X					
MFSR	X			X				
MPARTS	X					X		
MPD	X			X				
NCHPR	X		X					
NCHSTS	X		X					
NCHSUM	X		X					
NMUD	X				X			
OSCAR	X			X				
PIMR	X			X				
PPRMS	X	X						
RBS	X			X				
REMAS	X					X		
VMS	X					X		

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	6. Administer Medicaid and SCHIP	6.1 Manage state plan approval	6.2 Maintain Medicaid and SCHIP budgets	6.3 Evaluate state performance	6.4 Fund State Medicaid and SCHIP	6.5 Manage State Medicaid program and SCHIP initiatives	6.6 Provide Medicaid drug rebate management	6.7 Manage system certification
EPSDT	X			X				
FULSV2	X						X	
HCBSWTS	X	X						
MBES	X		X					
MDRI	X						X	
WTS	X	X						

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	7. Manage CMS relationships	7.1 Manage congressional relations	7.2 Manage media relations	7.3 Manage intergovernmental relations	7.4 Manage health care industry relations	7.5 Manage beneficiary representative organization relations	7.6 Manage employer group relations	7.7 Manage State relations
ATARS	X			X				

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	8. Provide administrative services	8.1 Manage administrative finance	8.2 Manage human resources	8.3 Manage information distribution	8.4 Manage contractors and procurement	8.5 Manage facilities	8.6 Provide information technology (IT) management and services	8.6.1 Establish and maintain information resources
AGGS	X				X			
BAAADS	X	X						
BCT	X	X						
BUCS	X	X						
CIS	X						X	
DESY	X						X	
DIAL	X						X	
DQD	X						X	
DSAF	X						X	
EMS	X		X					
ESID	X						X	
ESTS	X						X	
EXPERTS	X		X					
FACS	X	X						
FARA	X				X			
FTAPE	X						X	
GMATS	X				X			
HEIRS	X		X					
HIGHLIGHTS	X			X				
HITDB	X						X	
HITS	X		X				X	
HOPS	X					X		
HRMS	X		X					
HTS	X		X					
ISYS	X			X				
LERT	X		X					
MANRLINE	X						X	
OLRC	X		X					
ONREG	X		X					
PARKING	X					X		
PPSM	X			X		X		
PRISM	X				X			
RGSTRY	X		X					
RMS	X					X		
SYSTEMS	X						X	
TAIMS	X		X					
TRM	X						X	
VLTS	X		X					

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	9. Manage outreach and education	9.1 Perform policy change impact analysis	9.1.1 Provide policy clarifications to CMS partners	9.2 Determine health care requirements	9.3 Provide public/beneficiary awareness and assistance	9.3.1 Provide awareness of national clinical topics	9.4 Manage beneficiary communication	9.4.1 Investigate beneficiary inquiries and complaints	9.4.2 Reply to beneficiary inquiries and complaints	9.5 Manage customer outreach	9.5.1 Educate interested parties regarding PRO activities
CIS	X						X				
CONTACTS	X				X		X				
DFC	X				X		X			X	
HFR	X				X						
MBD	X						X				
MCC	X				X						
MCSC	X						X				
MGC	X						X				
NHC	X				X						
PDAP	X				X						
PPDIR	X				X						
PUBS	X				X						

Table 5–3. Applications Supporting Business Functions (Continued)

Applications	11. Manage program quality	11.1 Provide quality protection	11.1.1 Perform quality assurance	11.1.2 Perform mandatory case review	11.1.3 Perform payment error prevention activities	11.2 Improve quality	11.2.1 Perform quality improvement
ASPEN	X	X				X	
CATS	X					X	
GHP	X	X					
HAVEN	X	X				X	
HHAOASIS	X	X				X	
HPMS	X	X				X	
HSSS	X	X				X	
LTC	X	X				X	
MDS	X	X				X	
MEDQUEST	X					X	
MQMS	X	X				X	
OSCAR	X	X					
PATS	X					X	
QIES	X	X				X	
RAVEN	X					X	
SDPS	X	X				X	

Table 5–4. Relationship of Subject Areas to Applications

Subject area	AAPCC	ADR	AGGS	ALJTrack	APASS	APPS	APS	ASCPRICER	ASPEN	ATARS	BAAADS	BCT	BESS	BISC	BUCS	CACTS	CAFM	CAFMII	CASE-T	CASR	CATS	CCL	CERT	CHKTRK	CIS	CLD	CLFS	CMHS	CMIS	CMPTS	CONTACTS	CPE	CROWD	CSAMS	CTS	CWF	CWFMQA	DAT	DB	DCS	DESY	DFC
Agreement			X																										X			X										
Assessment																																										
Business_Statement										X	X	X			X																											
Client					X																X																					
Dispute_and_Resolution				X															X															X								
Document																										X																
Financial_Statement		X					X										X	X		X													X						X	X		
Health_Care_Plan	X							X																			X															
Human_Resource																																										
Insurer																																										
Location																																										
Material_Resource																																						X				
Partner																											X							X								
Party																																										
Policy_and_Regulation																																										
Provider																																										X
Service					X		X	X					X														X	X								X	X				X	
State_Medicaid_Agency																																										
Survey									X																																	

Table 5–4. Relationship of Subject Areas to Applications (Continued)

Subject area	DIAL	DMEFS	DNMNTR	DPC	DPPS	DPS	DQD	DSA	DSAF	ECP	EDBS	EMCSES	EMS	EPSDT	ESID	ESTS	EXPERTS	FACS	FARA	FID	FISS	FOI	FORM2802	FOSS	FTAPE	FULSV2	GEOHSD	GHP	GMATS	GROUCHRO	GROUPER	GTEMS	HAVEN	HCBSWTS	HCIS	HCMS	HCPCS	HCRIS	HEIRS	HFR	HHAOASIS	HIGHLIGHTS	HIGLAS	HISKEW
Agreement																			X						X				X															
Assessment														X																			X								X			
Business_Statement																																	X								X		X	
Client			X	X					X	X						X					X						X		X		X													X
Dispute_and_Resolution																																												
Document																																												
Financial_Statement					X	X											X			X																			X				X	
Health_Care_Plan		X																																										
Human_Resource													X			X																							X					
Insurer																																												
Location																		X																										
Material_Resource							X								X																													
Partner																								X																				
Party																																												
Policy_and_Regulation																																							X					
Provider																												X																
Service		X							X		X										X				X								X	X		X		X						
State_Medicaid_Agency																																			X									
Survey																								X																				

Table 5–4. Relationship of Subject Areas to Applications (Continued)

Subject area	HITDB	HITS	HOPS	HPBSS	HPMS	HRMS	HSSS	HTS	IBNR	ICRDB	IDE	IRIS	IRP	IRPTrack	ISYS	LABREL	LERT	LSC	LTC	MADS	MANRLINE	MAT	MBD	MBES	MBPRP	MCBS	MCC	MCIS	MCS	MCSC	MDDM	MDM	MDRI	MDS	MED	MEDPAR	MEDPOL	MEDQUEST	MFSR	MGC	MMCITS	MMCS	MPARTS	MPC
Agreement																																												
Assessment																																		X										
Business_Statement	X									X														X																				
Client				X																		X	X			X			X	X									X			X		
Dispute_and_Resolution																																		X										
Document										X																																		
Financial_Statement									X																																		X	
Health_Care_Plan					X																					X														X				X
Human_Resource		X				X		X								X	X																											
Insurer																																												
Location					X																																							
Material_Resource			X																																									
Partner																																		X										
Party																																												
Policy_and_Regulation																																						X						
Provider												X															X							X									X	
Service				X								X										X	X			X			X	X	X	X	X		X									
State_Medicaid_Agency									X																																	X		
Survey					X		X												X							X								X										

Table 5–4. Relationship of Subject Areas to Applications (Continued)

Subject area	MPD	MPES	MPFSM	MQMS	MQSA	MRS	MSA	MSIS	MSPPAY	MVPS	NCHPR	NCHSTS	NCHSUM	NEARLINE	NETTLVRS	NHC	NMTX	NMUD	NPS	OEOCR	OIGHTLNE	OLRC	ONREG	ORDPROJ	ORT98	OSCAR	OTIS	PAPPS	PARKING	PASS	PATS	PDAP	PECOS	PICS	PIMR	PIXL	PNS	POMRS	PORA	PORS	PPDIR	PPRMS	PPS	PPSM
Agreement																																												
Assessment				X																						X									X									
Business_Statement		X															X																											
Client								X																							X													
Dispute_and_Resolution																																												
Document																																												
Financial_Statement						X	X																			X									X						X	X	X	
Health_Care_Plan			X																														X											
Human_Resource																				X			X	X					X								X							
Insurer																																												
Location			X																																								X	
Material_Resource																											X																	X
Partner																																												
Party																																												
Policy_and_Regulation	X																														X													
Provider																X			X							X		X			X	X			X					X				X
Service					X			X			X	X	X	X	X		X																										X	X
State_Medicaid_Agency																																												
Survey																																												

Table 5–4. Relationship of Subject Areas to Applications (Continued)

Subject areas	PRICER	PRISM	PROFILES	PROTRAC	PSOR	PSOR97	PSPRICE	PS&R	PUBS	PULSE	QIES	RAFACT	RAVEN	RBS	RDW	REBUS	RECON	REMAS	REMIS	RGSTRY	RMS	ROINVENT	ROTRAVEL	RRS	SDPS	SGR	SIMS	SITEMAN	SMRF	SNFPRICER	SPACE	SPL	SRMS	SSPAF	STAR	STPW	SYSTEMS	TAIMS	TRM	UPIN	VLTS	VMS	WFPS	WI	WTS
Agreement																																													
Assessment											X		X												X																				
Business_Statement																																													
Client				X												X			X						X						X											X			
Dispute_and_Resolution																	X																												
Document										X																																			
Financial_Statement					X	X		X		X				X					X												X				X									X	
Health_Care_Plan	X						X																		X									X		X									
Human_Resource																				X			X																	X		X	X		
Insurer																																													
Location																																													
Material_Resource		X																			X	X						X										X	X						
Partner			X							X																																			
Party																																													
Policy_and_Regulation																																													
Provider																												X												X			X		
Service				X			X									X			X						X		X		X	X												X			
State_Medicaid_Agency	X																																												X
Survey																									X																				

Chapter 6
Infrastructure Architecture

The infrastructure architecture identifies and describes the hardware, software, and communications network technologies required to manage business applications throughout CMS's enterprise. Influences include communications networks, equipment capacities, operational procedures, and technology capabilities. The purpose of documenting the infrastructure architecture is to identify the existing technologies used to carry out key activities such as data security, preparation, storage, and retrieval across functional, organizational, and geographic boundaries. The infrastructure architecture is documented using the conceptual representation of common services and interfaces found in the Technical Reference Model (TRM).[1]

CMS began by inventorying the technology products used to support the infrastructure. Then, the applications supported by each individual product and the technical (rather than physical) operating locations of CMS applications were identified.

PRODUCTS INVENTORY

The ESID database was used to inventory the technology products in place at CMS, and the TRM was used to relate the products using representations of services and interfaces common to CMS information systems. At the time of publication, we had identified a total of 100 products broken out into four major service areas (MSAs):[2]

Application	63
Data management	15
Information processing	16
Middleware	6

Table 6–1 provides a detailed inventory of CMS preferred products sorted by major and basic service area (BSA).[3]

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[1] Volume 5, Section 5.5 of the HCFA IT Architecture, Version 2.0. November, 1999.

[2] The CMS TRM describes eight major service areas. The CMS products inventoried in the ESID database fall into four of the eight MSAs.

[3] Some technology descriptions were not available at the time of publication.

Table 6–1. Products Inventory

Major service area	Basic service area	CMS product	Description
Application	Application development tools	Access	Application development functionality of Microsoft Access. Access is a database program for Windows. Access is programmable using Visual Basic for Applications (VBA) and can read Paradox, dBASE and Btrieve files. It uses ODBC, Microsoft SQL Server, SYBASE SQL Server and Oracle data.
		Assembler Language (390)	Software that translates assembly language into machine language for IBM 390 mainframe systems.
		Borland C/C++ Compiler	ANSI C and C++ compiler from Borland for DOS and Windows applications.
		CLIST	Programming language similar to or used in conjunction with Time Sharing Option (TSO).
		COBOL2 VS Compiler	COmmon Business Oriented Language. A high-level programming language that has been the primary business application language on mainframes and minis. It is a compiled language and was one of the first high-level languages developed. COBOLII VS Compiler is a tool that conforms to ANSI 85 standards, provides 32-bit addressing, and allows programs to run "above the line."
		COBOL Compiler Optimizer	Software tool that improves the performance of COBOL Compiler.
		COOL:GEN	Modeling tool and application generator that turns COOL:Gen models into working code. Belongs to a family of tools from Sterling Software for modeling and developing enterprise applications for every major hardware platform.
		Clipper	Application development system from Computer Associates. Originally a dBASE compiler, it evolved into a programming language with many unique features that supports dBASE and non-dBASE databases. Clipper generates DOS programs, but third-party products enable it to create Windows applications. Clipper was originally developed by Nantucket Corporation.
		Cognos Powerplay	Online analytical processing (OLAP) software. It enables users to explore large volumes of summarized data with sub-second response times in a Web, Windows, or Excel environment. With Cognos PowerPlay, users at any business or technical skill level in a company can perform their own multidimensional analysis, create reports, and share them for better decision-making.
		Cognos Query	Lets novice and experienced users directly access corporate data resources for real-time data exploration. Using only a Web browser, users can navigate suites of published queries, saving and modifying them as required to meet their specifications.
		Cognos Query Architect	Add-on tool to Cognos Query that facilitates data exploration.
		Crystal Reports	Reporting and analysis software for Windows used to retrieve data from more than 30 types of databases. Using various Web options, queries and reports can be made via a Web browser. Crystal Reports functionality can also be added to proprietary programs written in languages such as C, C++, J++, Delphi and Visual Basic.
		DBASE	Comprehensive relational DB product with the ability to execute object and visual programming. Provides connectivity to a variety of SQL databases.
		Exsys Developer	Basic, versatile rule-based expert system development tool. Written in "C", Exsys Developer fits in best with older technologies or applications requiring fuzzy logic or special server restrictions.
		Flexus COBOL/SP2	All purpose user interface design and development tool which supports the ability to build character mode (text) screens or Graphical User Interface (GUI) screens and incorporate them into COBOL programs quickly and easily. COBOL sp2 also supports advanced display features in both text and GUI mode, including all of the standard windows user interface controls.
		Flexus Thin Client	Add-on product to the COBOL sp2 and FormPrint development tools which supports the ability to build 100% COBOL applications which operate entirely on a network server. Because Thin Client operates across a TCP/IP network, your application can operate on an internal company Intranet or across the public access Internet. The Thin Client operates at a blazing speed compared to a typical web browser based client machine because the only data to pass through the TCP/IP network is a very tiny parameter block used to pass screen handling instructions and screen data. The Thin Client includes automatic version control to ease the task of maintenance, 128 bit encryption to provide data security and data compression to increase data transmission speed.
		Forte	Application development system for enterprise client/server environments from Sun. Introduced in 1994, it is a repository-driven system that supports Windows, Mac and Motif clients and all the major UNIX servers as well as VMS. It supports Oracle, Sybase and Rdb databases and provides partitioning for creating three-tier applications. Testing and debugging is done in an interpreted mode while production programs are compiled into C++ code.
		IDMS Language	Application development language used to create an Integrated Data Management System.
		ISPF Dialog Manager Services	Interactive System Productivity Facility. Used for writing application programs. Dialog Manager Services is used to develop dialogs for interactive terminal sessions.
		ISPF Editor	Interactive System Productivity Facility. A full-screen editor from IBM for writing application programs.
		Impromptu Admin	Assigns administration rights to users to deliver managed reporting for consistent, fact-based decision-making. Report authors use Impromptu to create business-context reports. Report authors can author virtually any report using Impromptu's superior frame-based reporting interface. Report data can come from any source, and reports can be deployed to Impromptu users across LANs and WANs, as well as to mobile users.
		Impromptu User	Delivers managed reporting for consistent, fact-based decision-making. Report authors use Impromptu to create business-context reports. Report authors can author virtually any report using Impromptu's superior frame-based reporting interface. Report data can come from any source, and reports can be deployed to Impromptu users across LANs and WANs, as well as to mobile users.

Table 6–1. Products Inventory (Continued)

Major service area	Basic service area	CMS product	Description
		Impromptu Web Reports	Impromptu add-on. Using reports created in Impromptu, Impromptu Web Reports delivers managed, print-ready reports across the Web for large groups of report consumers. Users can subscribe to published reports, and customize them to meet their specific needs.
		Merant Mainframe Express	Micro Focus Mainframe Express® is the leading work station-based development environment for IBM mainframe business applications. Programmers are more productive with this alternative to host-based development, as it enables them to edit, compile, debug and test applications on workstations by utilizing a comprehensive suite of mainframe emulators and specialized mainframe connectivity technology.
		Merant Net Express	Market leading COBOL development environment for Windows and UNIX platforms offering the only open scalable alternative to running COBOL systems on the mainframe. It combines a rich Windows development environment with tools for creating and extending enterprise business processes written in COBOL delivering distributed e-business COBOL applications on Windows or UNIX.
		MicroStrategy Agent	Business intelligence software component of MicroStrategy 7 that provides integrated query and reporting, powerful analytics, and decision support workflow on the desktop.
		MicroStrategy Intelligence Server	An analytical server that is optimized for enterprise querying and reporting as well as OLAP analysis. It processes report requests from all users of the MicroStrategy 7 Business Intelligence platform through windows, web, and wireless interfaces.
		Microfocus COBOL	COBOL programming tools that enable both migrating from mainframe to client/server and developing on client/server platforms for the mainframe.
		Microfocus Revolve	Tool that helps developers understand, document and improve COBOL applications on a daily basis. Revolve raises precision and productivity by allowing developers to think and work visually, improving time-to-market by accelerating understanding to a fraction of the time it would take using outdated technology or manual processes.
		Microfocus Workbench	Description information not available at time of publication.
		Model 204 User Language	Integrated fourth-generation environment for building Model 204 applications.
		Office 97 Developer's Edition	Description information not available at time of publication.
		Oracle Developer 2000	Description information not available at time of publication.
		Oracle Discoverer	Provides users with powerful, "on-demand" query and reporting capabilities in order to gain strategic insight into their business and formulate new ebusiness strategies.
		Oracle Discoverer Administration Edition	Designed for IT professionals, Discoverer Administration Edition (AE) is used to hide the complexity of the underlying data structure so that business users can focus on solving business issues instead of data access issues. Discoverer Administration Edition is also used to control user access to business areas and manage system performance.
		Oracle Discoverer User Edition	Provides users with powerful, "on-demand" query and reporting capabilities in order to gain strategic insight into their business and formulate new ebusiness strategies.
		Oracle Express	Business intelligence tool that provides a single, integrated software architecture to support strategic decision making. Express tools are end-user applications allowing data access, calculation, and information sharing, and tools supplying a visual, point-and-click environment for building OLAP applications capable of modeling, graphical display, forecasting, statistical analysis, communication, database management, and data acquisition.
		Oracle Express Server	Powerful and extensible calculation engine for creating derived data values.
		Oracle WebDB	Delivers relevant information and applications to customers, employees, and partners. Facilitates rapid development of portals, without code, using productive online tools.
		PCSAS	Statistical Analysis System for the PC platform. An integrated set of data management and decision support tools from SAS that runs on platforms from PCs to mainframes. It includes a complete programming language as well as modules for spreadsheets, CBT, presentation graphics, project management, operations research, scheduling, linear programming, statistical quality control, econometric and time series analysis, and mathematical, engineering and statistical applications. It also provides multidimensional data analysis (OLAP), query and reporting, EIS, data mining and data visualization.
		PL/1 Compiler	Programming Language 1 Compiler. A high-level IBM programming language introduced in 1964 with the System/360 series. It was designed to combine features of and eventually supplant COBOL and FORTRAN, which never happened. A PL/1 program is made up of procedures (modules) that can be compiled independently. There is always a main procedure and zero or more additional ones. Functions, which pass arguments back and forth, are also provided.
		PowerBuilder	Popular application development system for Windows client/server environments. It supports various databases, including DB2 and Oracle, and is also packaged with the Watcom SQL database. PowerBuilder provides visual programming tools as well as a BASIC-like programming language called PowerScript. Macintosh, Windows NT and UNIX support is also provided.
		PowerPlay Admin	Administration functionality of a decision support system from Cognos that summarizes information for management. It combines EIS and DSS features in an integrated environment, and its Transformer creates multidimensional views of information. It runs on Windows clients and VMS and UNIX servers.
		PowerPlay Enterprise Server	Enterprise server functionality of a decision support system from Cognos that summarizes information for management. It combines EIS and DSS features in an integrated environment, and its Transformer creates multidimensional views of information. It runs on Windows clients and VMS and UNIX servers.
		REXX	REstructured EXtended eXecutor. An IBM mainframe structured programming language that runs under VM/CMS and MVS/TSO. It can be used as a general-purpose macro language that sends commands to application programs and to the operating systems. REXX is also included in OS/2 Version 2.0.
		Remedy	IT service management and customer relationship management solution. Remedy offers an automated view of the network to handle availability and service level issues.
		RoboHelp	Software that creates professional Help systems for desktop applications, Websites, Intranets/Extranets, Web-based applications, Cross-platform applications, Oracle applications, online manuals and printed documentation.

Table 6–1. Products Inventory (Continued)

Major service area	Basic service area	CMS product	Description
		SAS	Statistical Analysis System. An integrated set of data management and decision support tools from SAS that runs on platforms from PCs to mainframes. It includes a complete programming language as well as modules for spreadsheets, CBT, presentation graphics, project management, operations research, scheduling, linear programming, statistical quality control, econometric and time series analysis, and mathematical, engineering and statistical applications. It also provides multidimensional data analysis (OLAP), query and reporting, EIS, data mining and data visualization.
		SAS-C Compiler	Separately coded SAS-C subroutine.
		SPF/PC	Description information not available at time of publication.
		Shockwave	A browser plug-in that lets output from Macromedia's Director, Authorware and Freehand software be viewed on the Web. Shockwave is a popular plug-in for viewing animated sequences.
		SoftSpy	Provides Interactive Debugging, Performance Tuning, and Quality Assurance Testing options for Model 204 User Language.
		TSO/ISPF Dialog Manager	Time Sharing Option/Interactive System Productivity Facility. Software that provides interactive communications for IBM's MVS operating system. It allows a user or programmer to launch an application from a terminal and interactively work with it. Used for writing application programs. Dialog Manager Services is used to develop dialogs for interactive terminal sessions.
		VBA	Visual Basic for Applications. A subset of Visual Basic that provides a common language for customizing Microsoft applications. VBA supports COM, which allows a VBA script to invoke internal functions within Excel, Word and other COM-based programs or to make use of stand-alone, external COM objects.
		Visual 2000	Powerful combination of productivity aids and superior modeling and customization capabilities. Visual 2000 enables clients to deliver superior engineering solutions and meet organization standards.
		Visual Basic 6.0 Enterprise	Version 6.0 of the BASIC programming language from Microsoft specialized for developing Windows applications. Widely used to write client front ends for client/server applications.
		Visual Basic Professional	Business version of Visual Basic.
		Visual Basic Script	Scripting language from Microsoft. Widely used on the Web for both client processing within a Web page and server-side processing in Active Server Pages (ASPs). Also used with the Windows Script Host (WSH) to perform functions locally on a Windows machine.
		Visual C++	C and C++ development system for DOS and Windows applications from Microsoft.
		Visual Interdev	Windows-based development system from Microsoft for building dynamic Web applications using Microsoft standards. It is used to write Active Server Pages that can interact with databases and ActiveX-based components in the server.
		Visual J++	Windows-based Java development system from Microsoft. It is used to create Java applications that can run on any platform or to create Windows-specific applications that call ActiveX components or Windows directly. Visual J++ also includes a Java compiler.
		WYLBUR	Interactive text editor and document formatter. Stores user's files in a special compressed format known as "edit format" or "WYLBUR format."
		Xpediter+/Code Coverage	Family of mainframe testing programs from Compuware. It provides the programmer with an assortment of debugging tools for TSO, IMS and other mainframe applications.
Data management	Metadata management	DataManager	Data manipulation program. Allows easy and logical manipulation using a graphical interface.
		IDMS	Integrated Data Management System.
		Repository/MVS	Database of information about Multiple Virtual Storage (MVS) (currently known as OS/390) applications software that includes author, data elements, inputs, processes, outputs and interrelationships.
	Non-relational data management	Excel	Full-featured spreadsheet for PCs and the Macintosh from Microsoft. It can link many spreadsheets for consolidation and provides a wide variety of business graphics and charts for creating presentation materials.
		Model 204	Mainframe database software.
	Relational database management system	Access	Database program for Windows. Available separately or included in the Microsoft Office suite. Access is programmable using Visual Basic for Applications (VBA). Access can read Paradox, dBASE and Btrieve files, and using ODBC, Microsoft SQL Server, SYBASE SQL Server and Oracle data.
		DBASE	Comprehensive relational DBMS for personal computers.
		DB2	DATABASE 2. A relational DBMS from IBM that was originally developed for its mainframes. It is a full-featured SQL language DBMS that has become IBM's major database product. Known for its industrial strength reliability, IBM has made DB2 available for all of its own platforms, including OS/2, OS/400, AIX (RS/6000) and OS/390, as well as for Solaris on Sun systems and HP-UX on HP 9000 workstations and servers.
		FoxPro	Xbase development system for Windows from Microsoft. Includes object orientation and client/server support.
		Oracle	Database software that incorporates the SQL language. Is portable to a wide variety of platforms.
		Oracle Personal Edition	Oracle database software designed for the personal PC.

Table 6–1. Products Inventory (Continued)

Major service area	Basic service area	CMS product	Description
		SAS	Statistical Analysis System. An integrated set of data management and decision support tools from SAS that runs on platforms from PCs to mainframes. It includes a complete programming language as well as modules for spreadsheets, CBT, presentation graphics, project management, operations research, scheduling, linear programming, statistical quality control, econometric and time series analysis and mathematical, engineering and statistical applications. It also provides multidimensional data analysis (OLAP), query and reporting, EIS, data mining and data visualization.
		SQL Server	Relational DBMS from Sybase that runs on OS/2, Windows NT, NetWare, VAX and UNIX servers. It is designed for client/server use and is accessed by applications using SQL or via Sybase's own QBE and decision support utilities.
		Unify DBMS	Relational DBMS for UNIX platforms.
	Data extraction	VSAM	Virtual Storage Access Method. An IBM access method for storing data, widely used in IBM mainframes. It uses the B+tree method for organizing data.
Middleware	Object request brokers	Transparent Gateway for DB2	Description information not available at time of publication.
	Transaction processing services	CICS	Customer Information Control System. A TP monitor from IBM that was originally developed to provide transaction processing for IBM mainframes. It controls the interaction between applications and users and lets programmers develop screen displays without detailed knowledge of the terminals used. It provides terminal routing, password security, transaction logging for error recovery and activity journals for performance analysis.
	Database access middleware	InfoHub	Description information not available at time of publication.
		Net8	Oracle networking technology.
		OmniConnect	Heterogeneous data access software; Sybase.
		StarSQL	Description information not available at time of publication.
Information processing	Desktop workstation	Desktop	Desktop computer. Refers to a personal computer such as a PC or Mac or to a workstation from Sun, IBM, etc. Whether in a horizontal case on top of the desk or in a tower under or to the side of the desk is not the issue. The term refers to a single-user computer in contrast to a server shared by multiple users and in contrast to a laptop, which provides portability.
	Desktop workstation operating system	DOS	Disk Operating System. A single-user operating system from Microsoft for the PC. The underlying control program for Windows 3.1, 95, 98 and ME. Windows NT and 2000 emulate DOS in order to support existing DOS applications.
		MacOS	MACintosh Operating System. Refers to all versions of Macintosh operating systems.
		Netware OS	Network operating system from Novell that support DOS, Windows, OS/2 and Macintosh clients.
		Windows 2000	Known as "Win2K" and "W2K." Windows 2000 comes in one client and three server versions. It adds support for Plug and Play, which makes adding peripherals considerably easier than in NT 4. Windows 2000 looks like Windows 95/98, but adds considerably more features, dialogs and options.
		Windows NT Workstation	Windows New Technology. A 32-bit operating system from Microsoft for Intel x86 and Alpha CPUs. The workstation version of NT is the client side of the client/server NT environment. Like Windows 95/98, NT includes built-in networking and preemptive multitasking. It also includes the same user interface, but some dialogs are different and many are exclusive to NT. NT supports multiprocessing systems, adds extensive security and administrative features, and offers a dual boot capability. Designed for enterprise use, each application can access 2GB of virtual memory.
		Windows 95/98	Windows 95 and Windows 98, both of which are close in appearance and functionality. Windows 95 introduced a new user interface that added more Macintosh features. It included preemptive multitasking, which allows programs to be timeshared together more effectively than in Windows 3.1, and Plug and Play, which makes adding new peripherals much easier than Windows 3.1. Unlike Windows 3.1, which was loaded after booting up with DOS, Windows 95 was a self-contained 32-bit operating system that boots with its own version of DOS. Windows 95 ran most Windows 3.x and DOS applications. Windows 98 is an upgrade to Windows 95 that tightly integrated the Internet Explorer Web browser with the OS. It added support for the Universal Serial Bus (USB) and dual monitors. In 1999, Windows 98 Second Edition fixed numerous bugs by incorporating Service Pack 1 with upgraded applications including Internet Explorer 5 and Outlook Express 5.
	Network computer	WinFrame/WinView	Software from Citrix Systems that turns a Windows NT 3.51 server into a centralized, timeshared computer. Windows applications are run on the server and only screen changes are sent to the client machines. WinFrame includes a copy of NT 3.51 integrated with Citrix's MultiWin multiuser technology and ICA (Independent Computing Architecture) presentation protocol.
		Windows NT Server	Windows New Technology. A 32-bit operating system from Microsoft for Intel x86 and Alpha CPUs. The server version referred to here includes Microsoft's Web server (IIS). Like Windows 95/98, NT includes built-in networking and preemptive multitasking. It also includes the same user interface, but some dialogs are different and many are exclusive to NT. NT supports multiprocessing systems, adds extensive security and administrative features, and offers a dual boot capability. Designed for enterprise use, each application can access 2GB of virtual memory. NT 4 Server, Enterprise Edition supports clustering and failover in the event of system failure.
	Workgroup server	Workgroup Server	Enterprise device (server) that facilitates electronic sharing of data among several thousand computers.

Table 6–1. Products Inventory (Continued)

Major service area	Basic service area	CMS product	Description
	Enterprise server	Enterprise Server-Large-scale Mid-tier	Processing that takes place on an enterprise-wide application server that sits between the user's machine and the database server. The middle tier server performs the business logic.
		Enterprise Server-Mainframe	Large computer system operating in the enterprise. There are small, medium and large-scale mainframes, handling from a handful to tens of thousands of online terminals. Large-scale mainframes support multiple gigabytes of main memory and terabytes of disk storage. Large mainframes use smaller computers as front end processors that connect to the communications networks.
	Enterprise server operating system	OS/2	Family of multitasking operating systems for x86 machines from IBM. Highly regarded as a robust operating system; provides a dual boot feature for OS/2 or DOS.
		OS/390	Primary operating system used in IBM mainframes.
		UNIX AIX	Advanced Interactive eXecutive. IBM's version of UNIX, which runs on 386 and higher PCs, RS/6000 workstations and 390 mainframes. It is based on AT&T's UNIX System V with Berkeley extensions.
		UNIX Solaris	Multitasking, multiprocessing operating system and distributed computing environment for Sun's SPARC computers from SunSoft. It provides an enterprise-wide UNIX environment that can manage up to 40,000 nodes from one central station. Solaris is known for its robustness and scalability, which is expected in UNIX-based systems.

APPLICATIONS SUPPORTED BY PRODUCTS

An understanding of which products support which applications aids in identifying those products most commonly used to support CMS's infrastructure and in identifying applications that will be affected by changes in the infrastructure and vice versa. Table 6–2 shows the number of applications supported by each product.[4]

Table 6–2. Number of Applications Supported by Products

CMS product	No. of applications
Application	
Application development tools	
Access	3
Assembler Language (390)	4
Borland C/C++ Compiler	0
CLIST	54
COBOL2 VS Compiler	0
COBOL Compiler Optimizer	84
COOL:GEN	0
Clipper	2
Cognos Powerplay	0
Cognos Query	2
Cognos Query Architect	0
Crystal Reports	0
Exsys Developer	2
dBase	0
Flexus COBOL/SP2	1
Flexus Thin Client	1
Forte	1

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[4] Based on the relationships documented in the ESID database.

Table 6–2. Number of Applications Supported by Products (Continued)

CMS product	No. of applications
IDMS Language	0
ISPF Dialog Manager Services	0
ISPF Editor	0
Impromptu Admin	0
Impromptu User	0
Impromptu Web Reports	0
Merant Mainframe Express	0
Merant Net Express	0
MicroStrategy Agent	1
MicroStrategy Intelligence Server	1
Microfocus COBOL	3
Microfocus Revolve	0
Microfocus Workbench	0
Model 204 User Language	71
Office 97 Developer's Edition	0
Oracle Developer 2000	0
Oracle Discoverer	0
Oracle Discoverer Administration Edition	0
Oracle Discoverer User Edition	0
Oracle Express	0
Oracle Express Server	0
Oracle WebDB	0
PC SAS	0
PL/1 Compiler	0
PowerBuilder	2
PowerPlay Admin	0
PowerPlay Enterprise Server	0
REXX	0

Table 6–2. Number of Applications Supported by Products (Continued)

CMS product	No. of applications
Remedy	0
RoboHelp	0
SAS	41
SAS-C Compiler	0
SPF/PC	0
Shockwave	0
SoftSpy	0
TSO/ISPF Dialog Manager	34
VBA	1
Visual 2000	0
Visual Basic 6.0 Enterprise	2
Visual Basic Professional	9
Visual Basic Script	3
Visual C ++	0
Visual Interdev	1
Visual J++	0
WYLBUR	0
Xpediter+/Code Coverage	0
Data management	
Metadata management	
DataManager	0
IDMS	5
Repository/MVS	0
Non-relational data management	
Excel	3
Model 204	72
Relational database management system	
Access	24
dBase	6
DB2	47
FoxPro	0
Oracle	56
Oracle Personal Edition	0
SAS	0
SQL Server	49
Unify DBMS	1
Data extraction	
VSAM	4
Middleware	
Object request brokers	
Transparent Gateway for DB2	0
Transaction processing services	
CICS	40

Table 6–2. Number of Applications Supported by Products (Continued)

CMS product	No. of applications
Database access middleware	
InfoHub	0
Net8	0
OmniConnect	0
StarSQL	0
Information processing	
Desktop workstation	
Desktop	42
Desktop workstation operating system	
DOS	1
MacOS	0
Netware OS	0
Windows 2000	0
Windows NT Workstation	0
Windows 95/98	0
Network computer	
WinFrame/WinView	1
Windows NT Server	32
Workgroup server	
Workgroup Server	27
Enterprise server	
Enterprise Server - Large-scale Mid-tier	77
Enterprise Server - Mainframe	163
Enterprise server operating system	
OS/2	0
OS/390	0
UNIX AIX	44
UNIX Solaris	4

Comprehensive product-to-application information (and the basis for Table 6-2) is in the CMS IT Architecture repository. Considering the summary information contained in Table 6-2 and the entire IT Architecture repository, we make the following observations by MSA:

◆ Application—COBOL Compiler Optimizer is the most widely used application development tool, supporting 28 percent of CMS's applications. CLIST is close behind with 23 percent.

◆ Data management—24 percent of CMS applications are Model 204, a non-relational data store. Oracle (18 percent), SQL Server (16 percent), and DB2 (15 percent)—relational database technology—account for a large portion of the remaining data management applications.

- Middleware—CICS, a transaction processing service, makes up 13 percent of the middleware in place at CMS.

- Information processing—mainframe applications comprise 54 percent of the enterprise server environment. UNIX accounts for 14 percent of the enterprise operating system environment.

Percentages are based on the total number of applications—304—which includes applications and aliases.

TECHNICAL OPERATING LOCATIONS OF APPLICATIONS

We also identified 10 technical operating locations. Table 6–3 provides an inventory of CMS operating locations.

Table 6–3. Operating Location Inventory

Operating location	Description
CMS Desktop	CMS desktop computers located in Central or Regional offices.
CMS Mainframe	CMS Data Center mainframe.
CMS Mid-tier	CMS Data Center mid-range server operating environment (processing takes place on an application server that sits between the user's machine and the database server).
CMSnet	CMS private Intranet.
Extranet	CMS Extranet.
Internet	Public Internet.
MCDN	CMS Medicare Data Communications Network. Provides connectivity between CMS locations and among the various entities that access Medicare data or support system operations, including claims processing contractors, fraud detection organizations, and state agencies.
Mobile	Distributed Laptop or PDA.
QualityNet	Peer Review Organization Distributed Network. Web and mid-tier operating environments (e.g., SDPS Extranet).
Unknown	Unspecified operating location.

Table 6–4 shows the number of applications supported by each operating location.[5] (The total number of applications does not equal the total number of applications inventoried in Chapter 5 because some applications run in multiple operating locations or are not currently linked to an operating location.) Table 6–5 shows the relationships between CMS applications and technical operating locations.

Table 6–4. Number of Applications Supported by Operating Location

Operating location	No. of applications
CMS Desktop	38
CMS Mainframe	153
CMS Mid-tier	33
CMSNet	21
Extranet	5
Internet	17
MCDN	9

Table 6–4. Number of Applications Supported by Operating Location (Continued)

Operating location	No. of applications
Mobile	6
QualityNet	7
Unknown	6
Total	295

Considering the information contained in Tables 6–4 and 6–5, we make the following observations:

- Fifty percent of CMS applications run in the CMS mainframe operating location.

- Only 7 percent of CMS applications run on Internet technology (CMSNet); even smaller percentages apply to Extranet (2 percent), Internet (6 percent), Mobile (2 percent), and QualityNet (2 percent).

Percentages are based on the total number of applications—304—which includes applications and aliases.

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[5] The concept of operating location is not fully defined at this time. The information is what is currently documented in the ESID database.

Table 6–5. Operating Location of Applications

Operating location	AAPCC	ADR	AGGS	ALJTrack	APASS	APPS	APS	ASCPRICER	ASPEN	ATARS	BAAADS	BBATS	BCT	BESS	BISC	BUCS	CACTS	CAFM	CAFMII	CASE-T	CASR	CATS	CC2K	CCI	CCL	CERT	CHKTRK	CIS	CLD	CLFS	CLTS	CMAN	CMDB	CMHS	CMIS	CMPTS	CONTACTS	CPE	CROWD	CSAMS	CTS	CWF	CWFMQA	DAT
CMS Desktop													X												X				X												X			
CMS Mainframe	X					X		X						X	X			X	X	X												X		X		X	X						X	X
CMS Mid-tier							X			X	X					X														X		X	X		X	X					X			
CMSnet												X													X									X						X				
Extranet																																												
Internet			X																																		X			X				
MCDN		X		X																																						X		
Mobile																X																												
QualityNet																																												
Unknown																										X																		

Table 6–5. Operating Location of Applications (Continued)

Operating location	DB	DCS	DD	DESY	DFC	DIAL	DMEFS	DNMNTR	DPC	DPPS	DPS	DQD	DSA	DSAF	ECP	EDBS	EMCSES	EMS	EPSDT	ESID	ESRD-CIP	ESTS	EXPERTS	FACS	FARA	FID	FISS	FOI	FORM2802	FOSS	FTAPE	FULSV2	FWADT	GEOHSD	GHP	GMATS	GROUCHRO	GROUPER	GTEMS	HAVEN	HCBSWTS	HCIS	HCMS	HCPCS
CMS Desktop			X										X		X										X			X	X							X	X							X
CMS Mainframe	X	X		X			X	X		X	X			X		X		X		X			X	X	X						X				X							X		
CMS Mid-tier				X		X																			X								X		X							X		
CMSnet												X						X	X	X						X																		
Extranet				X																																								
Internet					X																												X									X	X	
MCDN																	X										X																	
Mobile																														X													X	
QualityNet																																												
Unknown																																												

Operating location	HCRIS	HEIRS	HFR	HHAOASIS	HIGHLIGHTS	HIGLAS	HISKEW	HITDB	HITS	HOPS	HPBSS	HPMS	HRMS	HSSS	HTS	IBNR	ICRDB	IDE	IRIS	IRP	IRPTrack	ISYS	LABREL	LERT	LSC	LTC	MADS	MANRLINE	MAT	MBD	MBES	MBPRP	MCBS	MCC	MCIS	MCS	MCSC	MDDM	MDM	MDRI	MDS	MED	MEDPAR
CMS Desktop														X							X				X	X									X								
CMS Mainframe	X	X					X		X	X									X								X	X		X	X	X						X	X	X	X	X	X
CMS Mid-tier															X			X									X																
CMSnet						X			X				X											X																			
Extranet											X																																
Internet			X									X																						X									
MCDN																																											
Mobile																			X																				X				
QualityNet																																									X		
Unknown														X																													

Operating location	MEDPOL	MEDQUEST	MFSR	MGC	MMCITS	MMCS	MPARTS	MPC	MPD	MPES	MPFSM	MQMS	MQSA	MRS	MSA	MSIS	MSPPAY	MVPS	NCHPR	NCHSTS	NCHSUM	NEARLINE	NETTLVRS	NHC	NMTX	NMUD	NPS	OEOCR	OIGHTLNE	OLRC	ONREG	ORDPROJ	ORT98	OSCAR	OTIS	PAPPS	PARKING	PASS	PATS	PDAP	PECOS	PICS	PIMR
CMS Desktop										X	X														X				X			X	X			X		X					
CMS Mainframe			X			X	X	X						X		X		X	X	X	X	X	X			X								X	X			X			X	X	X
CMS Mid-tier					X				X																					X											X		X
CMSnet	X												X																		X	X											
Extranet																																											
Internet			X																						X		X													X			
MCDN																																											
Mobile		X																																									
QualityNet																																							X				
Unknown																																											

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Table 6–5. Operating Location of Applications (Continued)

Operating location	PIXL	PLANID	PNS	POMRS	PORA	PORS	PPDIR	PPRMS	PPS	PPSM	PRICER	PRISM	PROFILES	PROTRAC	PSOR	PSOR97	PSPRICE	PS & R	PUBS	PULSE	PULSE-PC	QIES	RAFACT	RAVEN	RBS	RDW	REBUS	RECON	REMAS	REMIS	RGSTRY	RMS	ROINVENT	ROTRAVEL	RRS	RTS	SDPS	SGR	SIMS	SITEMAN	SMRF	SNFPRICER	SPACE
CMS Desktop			X	X	X								X	X		X										X							X	X						X			
CMS Mainframe						X		X		X		X			X		X		X				X		X		X	X												X	X	X	X
CMS Mid-tier																													X														
CMSnet												X																			X												
Extranet																																											
Internet							X													X													X										
MCDN																					X																						
Mobile																																											
QualityNet																						X			X					X				X					X				
Unknown																																											

Table 6–5. Operating Location of Applications (Continued)

Operating location	SPL	SRMS	SSPAF	STAR	STPW	STS	SYSTEMS	TAIMS	TRM	UPIN	VLTS	VMS	WFPS	WI	WTS
CMS Desktop	X		X		X										X
CMS Mainframe		X					X	X		X	X			X	
CMS Mid-tier															
CMSnet						X			X						
Extranet															
Internet															
MCDN				X								X			
Mobile															
QualityNet															
Unknown													X		

Appendix
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